



WARREN

**THE WARREN GROUP, INC.** FORENSIC ENGINEERS & CONSULTANTS  
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***Chad E. Jones, P.E., CMSE®, CFEl, CVFI***

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Mechanical Engineer

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

**HVAC Systems**

**Machine Design and Safeguarding**

**Piping Systems**

**Products Liability**

**Risk Assessment**

**Vehicle Fires**

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## EDUCATION

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**1995**                      **Bachelor of Science in Mechanical Engineering**  
Clemson University, Clemson, South Carolina

**1995**                      **Engineering Summer Abroad Program**  
University of Bristol, Bristol England

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## EXPERIENCE

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**2019 to Present**                      The Warren Group, Inc., Irmo, South Carolina. Senior Consulting Engineer providing analysis of machinery and equipment incidents and failures related to property loss and unintentional injury. Mechanical engineering analysis of machines, equipment, and facilities with regard to safety. Investigate the origin and cause of fires.

**Safety Design Analysis and Accident Prevention**

Industrial accident reconstruction, machine controls, machine safeguarding, OSHA compliance, standards and codes compliance, maintenance, products liability, product failures, risk assessment, failure analysis, consumer products.

**Heating, Ventilation, and Air Conditioning – HVAC, Plumbing**

Analysis of the design, installation, and operation of commercial, industrial, and residential HVAC and plumbing systems. Investigation of HVAC related issues including temperature, humidity, and property damage. Investigation of plumbing related issues including failures, installation, and property damage.

**Fire & Explosion Analysis**

Determine the origin and cause, as well as scope of damage, of fires and explosions in structures, equipment, and vehicles.

**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.

**2014 to 2019**                      Davis & Floyd, Inc. – Consulting Engineers. Associate Senior Mechanical Engineer. Engineer of Record for the design of HVAC, natural gas, steam, compressed air, fire suppression, smoke control and plumbing systems for commercial, federal, industrial, and private clients. Prepare engineering reports on subject matters such as temperature excursions, humidity excursions, mold growth, moisture problems and various HVAC and plumbing issues. Review calculations performed by Staff Engineer. Manage Construction activities including review of shop drawings, review and approval of pay applications, perform construction observations and perform site inspections with authorities having jurisdiction. Prepare technical specifications for projects. Prepare cost analysis for designs to facilitate client budgeting processes.

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## EXPERIENCE, Continued

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- 2007 to 2014** Davis & Floyd, Inc. – Consulting Engineers. Senior Mechanical Engineer. Engineer of Record for the design of HVAC, natural gas, steam, compressed air, fire suppression, smoke control and plumbing systems for commercial, federal, industrial and private clients. Perform HVAC load models per ASHRAE methodology utilizing Trane TRACE modeling software. Perform outside air calculations per ASHRAE methodology to provide code compliant outside air for occupied spaces. Prepare technical specifications for projects. Review shop drawings for compliance with contract documents. Site visits for compliance with contract drawings and specifications.
- 2004 to 2007** Cooper Power Systems, Greenwood Plant. Senior Manufacturing Engineer, Capacitor Products. Redesign capacitor vacuum processing equipment for Joint Venture in Shanghai, China. Duties included writing technical specifications for the equipment used in the joint venture contract, producing all structural steel and vacuum piping drawings in AutoCAD, specifying and purchasing high vacuum pumps, valves, instruments, and associated vacuum fittings. Redesign capacitor vacuum processing equipment for the Greenwood, SC facility, including complete redesign of the structure to change from I beam to structural tubing. Travel to customer job sites nationwide to resolve equipment installation issues. Design and specify various fixtures and tooling for a manufacturing operation. Responsible for site environmental compliance including generation, storage, and shipment of hazardous waste to maintain small quantity generator status, SPCC, SWPPP, and permitted air emissions stacks. Responsible for mechanical power press area including training and safety compliance to OSHA standards. Team member for various internal investigations of recordable injuries and reportable environmental releases. Carry out lean manufacturing duties to improve productivity and quality.
- 1999 to 2004** *Solutia*, Inc./Monsanto Chemicals, Greenwood Plant. Senior Process Engineer, Nylon, Plastics and Polymers. Manufacturing representative for batch & continuous reactor debottleneck project. Devised scheme to install necessary piping tie-ins without a shutdown, saving \$250K overhaul cost plus 10 days lost production. Responsible for approval of all layout drawings, operating procedures required with installation of new equipment, and establishment of spare parts and preventive maintenance schedule. Assumed role of Project Manager for checkout, startup, and demonstration phase of the batch & continuous reactor debottleneck project. The \$2.7M project was completed under budget, with no recordable injuries, and resulted in a 27% increase in production. Process Engineer for project to inject additives into a constantly stirred tank reactor operating at 250psi. Duties included specifying pumps, field piping design, and writing operating instructions. Authorized confined space entrant, attendant, and entry supervisor. Team member for various internal investigations of recordable injuries and reportable environmental releases.

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## EXPERIENCE, Continued

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**1996 to 1999**      Monsanto Chemicals – Fibers Division, Greenwood Plant. Process Engineer – Nylon Manufacturing/Carpet R&D Organization. Led project to improve waste aspiration system on bulked continuous filament line resulting in a decrease of waste by 308K lbs. in the first year; a savings of \$385K to the business. Responsibilities included building business justification for the project and demonstrating project deliverables/savings on completion of the project. Facilitated installation of new string-up device resulting in a 5% increase in machine efficiency. Resolved an unexpected conditioner steam tube sizing problem during a 5-day overhaul in time for scheduled start-up, including sizing appropriate lines and fittings, expediting materials, and overseeing piping trades. Certified fork truck operator. Certified process equipment operator.

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## CERTIFICATIONS

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IFSAC Certified Interior Structural Firefighter I & II  
 CFEI Certified Fire and Explosion Investigator (#14287)  
 CVFI Certified Vehicle Fire Investigator (#24836-14287v)  
 CMSE® Certified Machinery Safety Expert  
 Certified Mobile Elevating Work Platform Operator

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## PROFESSIONAL ORGANIZATIONS

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National Association of Fire Investigators (24836)  
 National Fire Protection Association® (1111916855)  
 South Carolina International Association of Arson Investigators

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## REGISTRATIONS

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Professional Engineer in Alabama (#40346)  
 Professional Engineer in Arkansas (#21895)  
 Professional Engineer in Florida (#91294)  
 Professional Engineer in Georgia (#033935)  
 Professional Engineer in Mississippi (#34071)  
 Professional Engineer in North Carolina (#036432)  
 Professional Engineer in South Carolina (#26199)  
 Professional Engineer in Tennessee (#124146)  
 Professional Engineer in Texas (#146309)

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**REGISTRATIONS (Continued)**

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Professional Engineer in West Virginia (#24421)

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**CONTINUING EDUCATION**

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**November 25, 2025**

“Mobile Elevated Work Platforms”, a course presented by UL LLC, Greenwood, SC

**August 25, 2025**

“Explosion Dynamics”, a course presented by CFI Trainer.net Online

**February 19, 2025**

“Florida Laws and Rules for Professional Engineers,” a course presented by EZ-pdh.com Online

**February 19, 2025**

“Florida Ethics for Professional Engineers,” a course presented by EZ-pdh.com Online

**February 10-14, 2025**

Certified Machinery Safety Expert Training, a course presented by Marc Willemeit for Pilz, Nashville, Tennessee

- Machinery Safety Legislation
- Risk Assessment
- Mechanical Guarding
- Safety Components and Technologies
- Electrical Safety
- Functional Safety of Control Systems

**September 16, 2024**

“Engineering Ethics: Conflicts of Interest,” a course presented by SunCam Online

**September 16, 2024**

“Pipe Support Failures,” a course presented by SunCam Online

**September 12, 2024**

“Psychrometrics Part 2 - SHR, Calculating CFM and Tons of Refrigeration Practical,” a course presented by SunCam Online

**August 15, 2024**

“Safety in Design,” a course presented by SunCam Online

**February 19, 2024**

“The Deposition Part 2: Questioning Tactics and Effective Responses,” a course presented by CFI Trainer.net Online

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**CONTINUING EDUCATION, Continued**

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**February 19, 2024**

“The Deposition Part 1: Format, Content and Preparation,” a course presented by CFI Trainer.net Online

**December 15, 2023**

“Practical Guide to Writing Engineering Reports,” a course presented by SunCam Online

**September 25, 2023**

“Tiny Houses Mechanical, Electrical, and Plumbing Systems,” a course presented by SunCam Online

**September 25, 2023**

“Seismic and Wind Information HVAC Engineers Should Know,” a course presented by SunCam Online

**September 15, 2023**

“Understanding Sensors – Sensor Technology,” a course presented by SunCam Online

**August 16, 2023**

“The Citicorp Tower, Professional Ethics and Disaster Averted,” a course presented by SunCam Online

**August 15, 2023**

“Forensic Analysis Involving Fugitive Natural Gas and Propane,” a course presented by SunCam Online

**November 14, 2022**

“Florida Engineering Laws & Rules for 2023,” a course presented by SunCam Online

**November 14, 2022**

“Engineering Ethics,” a course presented by SunCam Online

**May 18-19, 2022**

“SCIAAI 2022 Electric Appliance Failure and Analysis,” a course presented by Benjamin Roulcau P.E., Columbia, South Carolina

**March 4, 2022**

“Laws and Rules for Florida PE,” a course presented by PDH Academy Online

**December 31, 2021**

“2023 Ethics for Florida Engineers,” an online course presented by PDHLibrary.com

**September 27-30, 2021**

“Vehicle Fire Investigation Training Program,” a 28-hour classroom course presented by The National Association of Fire Investigators, International, Lexington, Kentucky

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## CONTINUING EDUCATION, Continued

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**September 20, 2021**

“SCIAAI 2021 – Fire & Explosion Investigations Involving Propane and Natural Gas” an 8-hour course presented by Jerry R. Tindal, South Carolina Fire Academy, Columbia, South Carolina

**June 14, 2021**

“Photogrammetry 4 Forensics,” a webinar presented by Eugene Liscio

**December 18, 2020**

“Mobile Elevating Work Platform Operator Training”, presented by Sunbelt Rentals including classroom and hands-on operation, South Carolina

**December 16, 2020**

“Arc Evaluation and Arc Mapping”, a course presented by IAAI Online

**December 15, 2020**

“Ethics for the Practicing Engineer – An Introduction”, an online course presented by EZ-pdh.com

**July 22, 2020**

“Motor Vehicles: The Engine and the Ignition, Electrical, and Fuel Systems”, an online course presented by IAAI Online

**July 22, 2020**

“Motor Vehicles: Transmission, Exhaust, Brake, and Accessory Systems”, an online course presented by IAAI Online

**July 21, 2020**

“Investigating Motor Vehicle Fires”, an online course presented by IAAI Online

**July 20, 2020**

“Fire Investigator Scene Safety”, an online course presented by IAAI Online

**May 22, 2020**

“Practical Forensic Engineering Property – Part 1”, an online course presented by SunCam

**March 9-12, 2020**

“International Fire, Arson, & Explosion Investigation Training Program”, a 28-hour training program presented by the National Association of Fire Investigators, International, Pittsburgh, Pennsylvania

**December 2, 2019**

“Ethics for Engineers Based on the NSPE “Code of Ethics for Engineers”, an online course presented by SunCam

**October 25, 2019**

“Automotive Bearing Technology”, an online course presented by Robert P. Tata, SunCam

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**CONTINUING EDUCATION, Continued**

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**October 22-23, 2019**

Property Loss Research Bureau, Eastern Regional Conference, Charlotte, North Carolina

- Biomechanics of Injuries
- Fire & Arson Investigation Tips for Adjusters

**October 14, 2019**

“Roller Bearing Technology”, an online course presented by Robert P. Tata, SunCam

**October 14, 2019**

“Introduction to Thermal Imaging”, an online course presented by Joseph Osowski, SunCam

**May 14-17, 2019**

Certified Machinery Safety Expert Training, a course presented by Lee Burk for Pilz, Detroit, Michigan

- Machinery Safety Legislation
- Risk Assessment
- Mechanical Guarding
- Safety Components and Technologies
- Electrical Safety
- Functional Safety of Control Systems
- Functional Safety of Pressurized Fluid Systems

**November 15, 2018**

“Steam System Design” a course presented by David Pleasants, James M. Pleasants Company, Greenville, South Carolina

**October 16, 2018**

“Designing Optimal Comfort for Restaurant Patios” a webinar presented by Pam Davis, Schwank USA, Inc.

**May 22, 2018**

“Daikin Variable Refrigerant Volume” a course presented by Floyd Shasteen and Ken Boesner for Hoffman & Hoffman, Inc., MT Anderson Support Center, Greenville, South Carolina

**December 14, 2017**

Schwank Seminar, Schwank USA, Inc., Waynesboro, Georgia

- Air Curtain Design and Application” presented by Pam Davis
- IR Heating Design for Fire Stations and Auto Garages presented by Ryan Matthews

**November 2, 2017**

“Hot Water System Design” a course presented by Chris Edmondson, James M. Pleasants Company, Greenville, South Carolina



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**CONTINUING EDUCATION, Continued**

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**October 26, 2017**

“Energy Recovery & DOAS Systems and Trends in Lab Exhaust” a course presented by Joe Thorndal for Hoffman & Hoffman, Inc, MT Anderson Support Center, Greenville, South Carolina

**August 22, 2017**

“Moisture Removal Efficiency and Low Dewpoint Design” a course presented by Vijay Periannan for Hoffman & Hoffman, Inc., MT Anderson Support Center, Greenville, South Carolina

**May 17-18, 2016**

“Steam Plant Improvement & Boiler Workshop”, a 15-hour workshop presented by Thomas E. Burch for the Boiler Efficiency Institute, Greenville, South Carolina

**December 3, 2015**

“Instantaneous Comm. Water Heating Solutions” a course presented by Kunal Shah, Spartanburg, South Carolina

**December 3, 2015**

“Self-Sensing Variable Speed Pumps” a course presented by Rich Madeiros, Spartanburg, South Carolina

**December 3, 2015**

“Chilled Beam Systems” a course presented by Nick Searle, Spartanburg, South Carolina

**December 3, 2015**

“Controlling Heat Transfer in HVAC Systems” a course presented by Jerry Boulanger, Spartanburg, South Carolina

**September 15, 2015**

“Plumbing Water Systems” a course presented by Chris Edmondson, James M. Pleasants Company, Greenville, South Carolina

**September 11, 2015**

“Airflow Measurement for Acceptable Indoor Air Quality” a 2-day seminar presented by EBTRON, Loris, South Carolina

**May 27, 2015**

“Hospital HVAC Design Symposium” presented by Mike Crowder for Hoffman & Hoffman, Inc., Greenville, South Carolina

**December 3, 2014**

“Steam System Design” a course presented by Roy Ahlgrem, James M. Pleasants Company, Greenville, South Carolina

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**CONTINUING EDUCATION, Continued**

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**October 9, 2014**

SPX Road Show, Greenville, South Carolina

- Optimal Cooling Tower Design, Variable Flow, Free Cooling, presented by Ken Martens of SPX Corporation
- Optimizing Your Pumping Systems, presented by David Lee of Armstrong Fluid Technology
- Advanced Metrics for Water Treatment Systems, presented by Michael Patton of Griswold Water Systems

**June 25, 2014**

“Energy Efficient Hot Water Boiler Plant Design” a course presented by James M. Pleasants Company, Greenville, South Carolina

**February 17, 2014**

“Update to Code Requirements for the Restraint of Non-Structural Components” a course presented by Synergy Engineering, PA, Greenwood, South Carolina

**November 19-20, 2013**

Steam Plant Improvement Workshop, presented by Boiler Efficiency Institute, Greenville, South Carolina

**April 9, 2013**

“ABB Variable Frequency Drives for HVAC & Cooling Tower Applications” a course presented by Perry Conte of Hoffman & Hoffman, Greenville, South Carolina

**March 21, 2013**

“Boilers & Domestic Water Heating; Technology, Design & Applications” a seminar presented by Mike Doychak of PVi Water Heating/Riverside Hydroponics, Greenville, South Carolina

**November 28, 2012**

“Steam System Design” a course presented by Roy Ahlgren, James M. Pleasants Company, Greenville, South Carolina

**October 25, 2012**

“VRV Design Considerations” a course presented by Trent Goodman of Hoffman & Hoffman, Inc., Greenville, South Carolina

**October 25, 2012**

“Energy Comparisons of VRF and Traditional HVAC Systems” a course presented by Trent Goodman of Hoffman & Hoffman, Inc., Greenville, South Carolina

**June 11, 2012**

“Hazardous Location Seminar” presented by Kerry Hunsicker for Hubbell/Killark, Greenville, South Carolina

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**CONTINUING EDUCATION, Continued**

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**April 4, 2012**

“Cooling Towers & Chiller Plant Piping Seminar” presented by James M. Pleasants Company, Greenville, South Carolina

**November 16, 2011**

“Energy Efficient Chilled Water Systems Seminar” presented by Roy Ahlgrem, James M. Pleasants Company, Greenville, South Carolina

**May 25, 2011**

“Using Polyisocyanurate Insulation in Mass Walls” a course presented by Matt Lorenz of RMAX, Greenwood, South Carolina

**November 28, 2012**

“Steam System Design” a course presented by Roy Ahlgrem, James M. Pleasants Company, Greenville, South Carolina

**May 24-28, 2010**

“Comprehensive Training for Energy Managers” a course presented by Greenville Technical College, Greenville, South Carolina

**May 5, 2010**

“Energy Efficiency through Building Automation” a course presented by TRANE, Greenville, South Carolina

**May 5, 2010**

“Ice Storage Applications” a course presented by TRANE, Greenville, South Carolina

**April 22, 2010**

Greenheck Technical Session on the AIRTOUR Mobile Learning Center

- Laboratory Exhaust Systems
- Energy Recovery
- Makeup Air/Outdoor

**April 6, 2010**

“IBC-2006 Seismic & Wind Restraint of MEP Equipment” a course presented by Synergy Engineering, PA, Greenville, South Carolina

**October 2009**

“Increased Seismic Protection of Bridges using Triple Pendulum Bearings and AASHTO Guild Specifications for LRFD Seismic Bridge Design” a course presented by Roy A. Imbsen, Earthquake Protection Systems, Greenville, South Carolina

**September 23, 2009**

“Hydronic Design and Application Seminar” a course presented by Roy Ahlgrem, James M. Pleasants Company, Greenville, South Carolina

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## CONTINUING EDUCATION, Continued

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**July 28, 2009**

“CALMAC Ice Storage Seminar” a course presented by TRANE, Greenville, South Carolina

**July 9, 2009**

“Geothermal/Water Source Heat Pump Systems: Design Considerations and Pitfalls to Avoid Seminar” a course presented by David Pleasants, James M. Pleasants Company, Greenville, South Carolina

**May 13, 2009**

“ICE STORAGE: Design & Applications” a course presented by TRANE, Greenville, South Carolina

**February 26, 2008**

“Fire Damper & Smoke Damper Codes – Update and Installation Details” presented by Stacia Deneve and Glenn Esser for Hoffman & Hoffman Inc, Greenville, South Carolina

**February 26, 2008**

“Air Measurement Devices & AMCA Testing” presented by Stacia Deneve and Glenn Esser for Hoffman & Hoffman Inc, Greenville, South Carolina

**February 5, 2008**

“Cooling Towers & Chiller Plant Piping Systems Seminar” presented by Chris Edmondson, James M. Pleasants Company, Greenville, South Carolina

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## COURSES, SEMINARS AND LECTURES PRESENTED

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**July 27, 2021**

“Cooking with Subrogation – Commercial Cooking Fires: What to Look for and Who Might Be Responsible,” a NASP Webinar co-presented with Shannon Warren

**January 20, 2021**

“Fire Origin and Cause Investigation Methods,” a live webinar presented with Chief Mike Mixon, Jr., and John Stewart of Jack Ward Fire Consultants, Columbia, South Carolina

*One-hour seminar, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled “Injuries with Saws, Lifts and Ladders”*

**October 9, 2019:** Selective Insurance

**December 11, 2019:** EMC