



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

Jennifer Morningstar, B.S.Ch.E., P.E., CFEI

Chemical Engineer

Chemical Release and Exposure

Codes and Standards Analysis

Confined Space Entry – Lockout/Tagout

Environmental Regulatory Compliance

Fires and Explosion Analysis: Origin and Cause

Industrial Accident Investigation

OSHA Process Safety

Scope of Damage/Cost to Repair

EDUCATION

1991	Bachelor of Science in Chemical Engineering Virginia Polytechnic Institute and State University, Blacksburg, Virginia
2000	Master of Business Administration University of South Carolina, Columbia, South Carolina

EXPERIENCE

2017 to Present The Warren Group, Inc., Irmo, South Carolina. President (2018) and Senior Consulting Chemical Engineer performing specialized consulting related to property loss and unintentional injuries resulting from industrial accidents, fires and explosions.

Fire & Explosion Analysis

Determine the origin and cause, as well as scope of damage, of fires and explosions in residences, commercial locations and industrial sites.

Chemical Release and Exposure

Consumer products exposure, process control system failures, chemical release incident analysis, ammonia exposure, carbon monoxide incidents, OSHA violations, refrigeration and cooling equipment analysis, fluid and vapor leaks.

Safety Design Analysis (both personal injury and property damage)

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

2011 to 2017

Administrative Manager, The Warren Group, Inc., Columbia, SC

Oversaw all administrative aspects of cases for forensic engineers. Familiar with workers' compensation, subrogation, and product liability insurance claim and litigation processes. Reviewed all reports issued by the firm.

2009 to 2010

Project Lead Engineer, Management Alternatives, Ltd., Ocala, FL

Directed assessment teams. Reviewed and approved all energy savings calculations. Responsible for staff on-site, relationship with client management, overall progress of projects, maintenance of e-records with clients.

EXPERIENCE (Continued)

2007 to 2009	<p>Energy Consultant, Management Alternatives, Ltd., Ocala, FL</p> <p>Consulted in a variety of industries. Diagnosed operations at highly energy-intensive facilities. Worked with operations employees to modify operation of equipment to decrease energy consumption. Developed and implemented non-capital process improvements. Created energy metrics and plant/corporate reporting and management tools to reduce clients' energy costs. Worked closely with all levels of client personnel, from hourly operations to department leaders during development and implementation/training phases.</p>
2003 to 2007	<p>Site Energy Management Coordinator, Eastman Chemical Company, Columbia, SC</p> <p>Implemented a data-driven management system to reduce energy expenditures by over 10% at their Polyethylene Terephthalate (PET) manufacturing facility. Maintained system for an additional two years. Installed similar systems in all of Eastman PET plants (Spain, Argentina, England, Holland, and Mexico) and the Polyethylene operation in Texas.</p>
2001 to 2003	<p>Specialty Plastics Area Engineer, Eastman Chemical Company, Columbia, SC</p> <p>Responsible for operations and staffing. Supervised chemical operators and office staff. Maintained ISO compliance. Successfully managed production during the transition of the business to another owner.</p>
1998 to 2001	<p>Area Coordinator, Intermediates Development Group, Eastman Chemical Company, Columbia, SC</p> <p>Completed large-scale process improvements projects requiring capital expenditures in excess of \$1M. Additionally, responsible for developing and maintaining the technical expertise of the Development Engineers in that area.</p>
1996 to 1998	<p>Building Supervisor, Eastman Chemical Company, Columbia, SC</p> <p>Responsible for the day-to-day operations and facility maintenance for two plants within the Intermediates Department. Developed and implemented the policies and procedures required to maintain all applicable OSHA 1910 and EPA requirements, specifically HON implementation.</p>

EXPERIENCE (Continued)

- | | |
|---------------------|---|
| 1991 to 1996 | <p>Process Improvement Engineer, Intermediates Development Group, Eastman Chemical Company, Columbia, SC</p> <p>Member of the Intermediates Department at the PET manufacturing facility. Responsible for identifying problems, designing experiments to test hypotheses and implementing solutions. Participated in the start-up of Eastman's PET plant in Mexico (Eastman's first outside the United States).</p> |
| 1987 to 1989 | <p>Co-op Student, E.I. DuPont de Nemours & Company, Lugoff, SC</p> <p>Worked with development engineers in the Nylon department. Collected, entered and analyzed autoclave data. Developed and implemented a process to improve dye control from batch to batch.</p> |

SUMMARY OF INDUSTRIAL EXPERIENCE

- Unit Operations: Distillation, Filtration, Extraction, Drying, Piping Systems
- Heat Exchanger Design/Sizing
- Distributed Control Systems
- Carbon Monoxide Abatement
- Boilers and Associated Systems (Coal-Fired & Natural Gas-Fired)
- Cogeneration
- Cooling Towers
- Polymer Processing
- Refrigeration/Chillers (Ammonia-Based, Multi-Stage)
- Mineral Extraction and Processing (Sodium Carbonates, Borates)
- Pulp and Paper Industry
- Animal Harvesting and Packaging Operations (Including Rendering)
- Grain Milling/Processing

SUMMARY OF REGULATORY EXPERIENCE

- ISO Compliance
- HON (Hazardous Organic NESHAP (National Emission Standard for Hazardous Air Pollutants)) Compliance
- OSHA 1910 Process Safety Management
 - Confined Space Entry
 - Incident Investigation
 - Lockout/Tagout
 - Process Hazard Analyses

SUMMARY OF REGULATORY EXPERIENCE (Continued)

- Spill Prevention, Control and Containment Procedures

CERTIFICATIONS

Certified Mobile Elevating Work Platform Operator, 2020

Certified Fire and Explosion Investigator (#22531-12937)

Certified Color Matcher – Eastman Chemical Company, 2002

Incident Investigator – 40hr Root Cause Failure Analysis (RCFA) training, Failsafe Network, 1996

OSHA-trained Process Hazard Analysis Study Leader, 1993

PROFESSIONAL ORGANIZATIONS

American Institute of Chemical Engineers

National Association of Fire Investigators (NAFI)

South Carolina Chapter of The International Association of Arson Investigators (SCIAAI)

REGISTRATIONS

Professional Engineer in South Carolina (#34669)

Professional Engineer in North Carolina (#045566)

Professional Engineer in Illinois (#062.072601)

Professional Engineer in Iowa (#P24692)

Professional Engineer in Georgia (#042613)

Professional Engineer in Louisiana (#0047741)

Professional Engineer in Missouri (#2018038397)

Professional Engineer in Tennessee (#124819)

Professional Engineer in West Virginia (#22754)

Professional Engineer in Oklahoma (#31334)

National Council of Examiners for Engineering and Surveying – Model Law Engineer (#17-881-85)

CONTINUING EDUCATION

November 17, 2021

“Life Cycle Mechanical Integrity”, presented by SunCam Online, Irmo, South Carolina

November 17, 2021

“Pipe Support Failures”, presented by SunCam Online, Irmo, South Carolina

CONTINUING EDUCATION, (Continued)

November 17, 2021

“Pipe Support Failures”, presented by SunCam Online, Irmo, South Carolina

November 16, 2021

“Introduction to Piping Engineering”, presented by SunCam Online, Irmo, South Carolina

November 16, 2021

“Building Mechanical Integrity Programs Into New Plants”, presented by SunCam Online, Irmo, South Carolina

December 16, 2020

“Battery Applications”, presented by Red Vector Online, Irmo, South Carolina

December 18, 2020

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

August 18, 2020

“Motor Vehicles: The Engine and the Ignition, Electrical, and Fuel Systems”, presented by CFI Trainer.net IAAI, Irmo, South Carolina

August 18, 2020

“Motor Vehicles: Transmission, Exhaust, Brake, and Accessory Systems”, presented by CFI Trainer.net IAAI, Irmo, South Carolina

August 11, 2020

“Investigating Motor Vehicle Fires”, presented by CFI Trainer.net IAAI, Irmo, South Carolina

August 5, 2020

“Fire Investigator Scene Safety”, presented by CFI Trainer.net, Irmo, South Carolina

November 8, 2019

“Ethics for the Practicing Engineer – Managing Risks Imposed on the Public”, presented by RedVector online, Irmo, South Carolina

April 4-5, 2019

“Prevention and Investigation of Commercial Kitchen Fires”, presented by William C. Barnhart III, Charlotte Fire and Police Training Academy, Charlotte, North Carolina

November 27-28, 2018

“2018 Large Loss Conference,” Property Loss and Resource Bureau, Nashville, Tennessee

- Anatomy of a Mega Claim: Too Large to Fail
- Just a Short Training Drive: Implementing a Rapid Response Team for Catastrophic
- Adjusting a Slow-Developing Commercial Fraud Claim: Forged Documents, Doctored Photographs & 26 Tons of Dead Fish

CONTINUING EDUCATION, (Continued)

November 27-28, 2018

“2018 Large Loss Conference,” Property Loss and Resource Bureau, Nashville, Tennessee
(Continued)

- Liar, Liar, House on Fire
- Investigating Large Property Fire Losses: Is it Arson or Accidental?

October 29, 2018

“Ethics for Professionals,” an online course presented by RedVector

March 1-2, 2018

DRI Toxic Torts and Environmental Seminar, Nashville, Tennessee

- A Historical Perspective on Environmental Statutes and the Implications for the Modern Lawyer
- A Toolbox of Science and Law for Pesticide and Agricultural Chemical Litigation
- CSI Nashville: Environmental Forensics
- The Road to Causation

March 1-2, 2018

DRI Toxic Torts and Environmental Seminar, Nashville, Tennessee (Continued)

- Protecting the Privilege and Ethics: When the Remediation Consultant Becomes Your Testifying Expert
- What, Me Worry? Environmental Reopeners
- What’s in the Water? Understanding Toxic Tort Litigation Arising from Water-Borne Pathogens
- Daubert at 25: Has the Gate Been Kept?

November 5-8, 2017

National Association of Subrogation Professionals 2017 Annual Conference, Austin, Texas

- Missing in Action! What is the Reasonable Person? A New and Improved Method of Engineering Failure Analysis and Cause Determination to Assist Workers' Compensation Subrogation Professionals in Obtaining Successful Lien Recoveries
- To Try or Not
- Workers’ Compensation Subrogation Boot Camp: “Carrier’s Right of Action” - What does it Mean? There are 51 Different Answers to this Question
- Spontaneous Failure of Sprinkler Heads
- Farmland Disaster: Managing and Investigating Agricultural Losses
- Evaluating, Investigation and Prosecution (or not) of the Machinery Design Defect Case
- Fire Scene Safety, Preservation, and Relationships: Three Keys to a Safe and Successful Fire Investigation
- Crushing Subro! How Liability Professionals Defeat Subrogation Efforts
- Yes, but is it Ethical? A Year in Review of Effective/Ineffective Communications and How to Handle them with Class

CONTINUING EDUCATION, (Continued)

October 10, 2017

“Investigating Natural Gas Systems,” an online course presented by International Association of Arson Investigators, Inc. at CFI Trainer.Net

October 3, 2017

“Residential Natural Gas Systems,” an online course presented by International Association of Arson Investigators, Inc. at CFI Trainer.Net

September 22, 2017

“Arc Mapping Basics,” an online course presented by International Association of Arson Investigators, Inc. at CFI Trainer.Net

September 20, 2017

“Basic Electricity,” an online course presented by International Association of Arson Investigators, Inc. at CFI Trainer.Net.

September 20, 2017

“Residential Electrical Systems,” an online course presented by International Association of Arson Investigators, Inc. at CFI Trainer.Net

July 31 – August 3, 2017

“International Advanced Fire Investigation Training Program” by The International Association of Fire Investigators (IAFI), Tampa, Florida (Tested)

May 31, 2017

Training in “Warren’s Written Fall Protection Program & Policies,” by Steve Hunt, CPCU, ARM, Fall Protection Manager, Irmo, South Carolina

“Fall Protection - 29 CFR 1926, Subpart M (1926.500- 1926.503) Training,” Course designed by: Prosafe Solutions, Inc., conducted by Steve Hunt, CPCU, ARM, Fall Protection Manager, Irmo, South Carolina

- Part I – Guardrails & Personal Fall Arrest Systems
- Part II – Horizontal Lifelines, Safety Nets, Roofing Procedures & Training

April 29, 2003

Polymer Technology, Eastman Chemical Company, Voridian – Columbia Operations

October 1996

Root Cause Failure Analysis, Eastman Chemical Company, Carolina Eastman Division

Spring 1993

OSHA Process Hazard Analysis Study Leader Training, Eastman Chemical Company, Kingsport, Tennessee

1993 - 2001

Annual HAZWOPER training 1993 – 2001

CONTINUING EDUCATION, (Continued)

Fall 1992

Statistical Process Control, Eastman Chemical Company, Columbia, South Carolina

Spring 1992

Design of Experiments, Eastman Chemical Company, Kingsport, Tennessee

COURSES, SEMINARS AND LECTURES PRESENTED

Property Claims Issues at Manufacturing Facilities

January 15, 2021 Presented at South Loss Association Luncheon, Atlanta, Georgia

May 26, 2021 Online Webinar

Introduction to Forensic Engineering

November 3, 2021 A webinar presented to NCADA

May 7, 2003

Intermediates Technology Course – Filter/Dryer Section, Eastman Chemical Company, Vordian – Columbia Operations