

DEREK T. NOLEN, MS, PE, CFEI, CGE
Senior Project Engineer
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Mr. Nolen is a mechanical forensic expert with over 36 years of experience as a Mechanical Engineer. His areas of expertise and trial experience include industrial and residential mechanical system and equipment failure analysis; explosion and fire analysis of LPG (propane and butane) and other flammable gas and liquid-related losses; fuel gas system analysis and testing; gas equipment and systems including pressure and vacuum vessels, regulators, relief, fill, control and cylinder valves, and residential and industrial appliances and their role in fires, explosions, and carbon monoxide production; stationary/mobile fuel distribution systems; industrial machinery; appliances and valves; heavy equipment fires and failures; residential and industrial HVAC and refrigeration systems; fluid mechanics; and heat transfer.

EDUCATION

Master of Science, Mechanical Engineering, University of Houston, 1999
Bachelor of Science, Mechanical Engineering Technology, University of Houston, 1988
Associates of Engineering, Mechanical Engineering, Tri-Cities State Tech, 1981

AREAS OF EXPERTISE

Appliances and valves
Equipment failure analysis
Explosion and fire analysis of LPG (propane and butane) and other fuel gas losses
Fluid mechanics
Fuel distribution systems
Gas equipment and systems
Heat transfer
Heavy equipment fires and failures
HVAC and refrigeration systems
Industrial machinery
Mechanical system failure analysis

CERTIFICATION & LICENSURE

Licensed Professional Engineer (PE) – Alabama, Georgia, Kansas, Kentucky, Maryland, North Carolina, Oklahoma, Puerto Rico, Texas, & Virginia
Certified Fire and Explosion Investigator (CFEI), National Association of Fire Investigators (NAFI)
Certified Gas Engineering (CGE), American Society of Gas Engineers (ASGE)

WORK HISTORY

Senior Project Engineer, *AEI Corporation*, 2023-Present
Engineering Manager/Consulting Engineer, *McDowell Owens Engineering*, 1986 – 2023
Mechanical Engineering Technician, *Craddock, McDowell & Crane, Inc.*, 1982-1986
Manufacturing Engineering Technician, *Hydril Company*, 1982

AFFILIATIONS

American Society for Testing and Materials (ASTM) Committee E30 – Forensic Sciences

American Society for Testing and Materials (ASTM) Sub-Committee E30.05 – Engineering
American Society of Mechanical Engineering (ASME)
International Association of Arson Investigators (IAAI)
National Association of Fire Investigators (NAFI)
American Society for Testing and Materials (ASTM)

PUBLICATIONS

Gamse, B., McDowell, J.L., **Nolen, D.T.**, & Camara, N. Bad science from Big Brother. *Annual Meeting American Academy of Forensic Sciences, Dallas, Texas, February 2004.*

Nolen, D.T., Mc.Dowell, J.L., Tajkowski, K.M., & Dahlberg, E.P. Virtual loosening of fittings from elevated temperatures. *Annual Meeting American Academy of Forensic Sciences, Dallas, Texas, February 2004.*

Gamse, B., **Nolen, D.T.**, & Dahlberg, E.P. Premature failure of a floating ring rotary compressor incorporating liquid lubrication. *Annual Meeting American Academy of Forensic Sciences, Atlanta, Georgia, February 2002.*

RESEARCH AND TESTING

Air flow analysis of dryers

Brake system analysis with accelerometers on anti-lock brake systems and standard brakes in relation to drag factors on various surfaces

Extensive testing and analysis in relation to 1st, 2nd, single stage, and appliance regulators and their reaction to over-pressure and/or vent blockage

Over-filled propane containers and their response to controlled heat application

Testing of various gas controls and their reaction to over-pressurization

“Window Shade” seatbelt systems, their purpose and effectiveness

SEMINARS & ADDITIONAL TRAINING

American Society of Mechanical Engineers (ASME)

Pressure Relief Devices: Design, Sizing, Construction, Inspection and Maintenance, The American Society of Mechanical Engineers (ASME)– October 2016

API 579-1/ASME FFS-1 Fitness for Service, The American Society of Mechanical Engineers (ASME) – October 2015

Detail Engineering of Piping Systems, The American Society of Mechanical Engineers (ASME) – June 2014

Bolted Joints and Gasket Behavior, The American Society of Mechanical Engineers (ASME) – October 2013

The Gas Turbine: Principles & Applications, The American Society of Mechanical Engineers (ASME) – October 2012

Centrifugal Pump Design and Applications, American Society of Mechanical Engineers (ASME) – October 2011

Gas Transmission and Distribution Piping Systems, American Society of Mechanical Engineers (ASME) – October 2010

Hydraulics and Pneumatics, American Society of Mechanical Engineers (ASME) – December 2009

Intro to Finite Element Analysis, American Society of Mechanical Engineers (ASME) – October 2006

An Introduction to the Design and Behavior of Bolted Joints Course, American Society of Mechanical Engineers (ASME) – November 2005

Basic Engineering Seminar, American Society of Mechanical Engineers (ASME) – Fall 1990

HAZMAT

Hazardous Materials Transportation Training and Security Awareness Training, U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration – March 2012

National Association of Fire Investigators (NAFI)

Proceedings of the 7th International Symposium on Fire Investigation Science and Technology (ISFI),

National Association of Fire Investigators, International (NAFI) – September 2016
Advanced National Fire, Arson & Explosion Investigation Training Program, The National Association of Fire Investigators (NAFI) – August 2011
Society of Automotive Engineers (SAE)
Side Impact Protection TOPTEC Course, Society of Automotive Engineers (SAE) – Summer 1994
Airbags in Modern Transportation TOPTEC Course, Society of Automotive Engineers, Inc. (SAE) – May 1993
Miscellaneous
A Basic Guide to Above-Ground Atmospheric Storage Tanks Utilized in the Energy Production Industry – December 2022
A Lesson in Lock Out Tag Out from Phillips 66 Disaster – December 2022
Combustion Turbine Power Plants – December 2022
Fundamentals of Petroleum Refining – December 2022
A Guide to Develop a Cold Start Readiness Procedure, After Turnarounds & Shutdowns – November 2022
Gas Pipeline Hydraulics – November 2022
Combustible Dust Explosions- Causes and Prevention, Decatur Professional Development, LLC – December 2021
Overview of Fire Alarm and Detection Systems, Decatur Professional Development, LLC – December 2021
Stairwell Pressurization Systems, Decatur Professional Development, LLC – December 2021
Understanding MEP Systems for Buildings, Decatur Professional Development, LLC – December 2021
Advanced Incident Troubleshooting Guide, Decatur Professional Development, LLC – December 2020
Best Practice for Managing Process Safety During Turnarounds & Routine Business Cycles, Decatur Professional Development, LLC – December 2020
Engineering Ethics Citicorp Center – The Engineering Disaster That Didn't Happen (Video on Demand), Decatur Professional Development, LLC – December 2020
Incident Investigation and Techniques 201, Decatur Professional Development, LLC – December 2020
Engineering Fundamentals; The New London School Explosion; Heat Transfer; The MEP Design of Building Services; Continuing Education and Development, Inc. – December 2019
America's Greatest Projects and Their Engineers – The Alaska Pipeline – October 2018
Compressors and Compressed Air Systems – October 2018
Control Valve Basics – Sizing and Selection – October 2018
Case Studies of Three Explosions and a Chemical Accident – December 2017
Determining Negligence in Engineering Failures – December 2017
Finding the Root Cause – December 2017
Fire Protection Fundamentals – November 2017
Fundamentals of HVAC Systems – I-P (Full Course), American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. – February 2008
Introduction to Fire Dynamics Simulator and Smokeview, The Society of Fire Protection Engineers (SFPE) – September 2002
Combined S.O.A.R., W.A.T.A.I. and T.A.A.R.S. Accident Reconstruction Seminar – June 1990
Combined S.O.A.R. and W.A.T.A.I. Accident Reconstruction Seminar – August 1989
Air Conditioning Unit and Well Pump Motor Evaluation for Lightning Damage – August 1988
National Society of Forensic Engineers Accident Reconstruction Seminar – May 1988
Society of Accident Reconstructionist Conference and Seminar – September 1986
Texas Engineering Extension Service, Advanced Accident Reconstruction Training, Texas A&M – August 1985