



CLIFFORD C. BIGELOW, P.E., CFEI, CVFI SENIOR CONSULTANT

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Mr. Bigelow has over 30 years of engineering experience in the fields of failure analysis, metallurgy, materials and mechanical engineering, accident investigation, fire investigation, product development, testing, and design.

He has gained broad experience conducting comprehensive in-field and laboratory investigations of damage and failures involving transportation equipment, industrial machinery, tools, and consumer products. His experience includes engineering investigations of automobile and truck accidents, industrial accidents, and failure analysis of a wide range of manufacturing and process equipment such as pressure vessels, weldments, rotating equipment, valves, piping, and castings.

His expertise has been applied in the failure analysis of automobile and truck engines, chassis, and HVAC systems, as well as railroad and aircraft systems, including aircraft turbine and reciprocating engines. His experience includes the investigation and analysis of fires involving automobiles and trucks, off road vehicles and heavy equipment.

Mr. Bigelow is also active in the investigation of residential and industrial fire and explosions, fire cause analysis of fuel gas and electrical systems with specialization in laboratory analysis of materials in fire cause determinations.

Mr. Bigelow is proficient in materials laboratory procedures including optical microscopy, metallography, scanning electron microscopy (SEM/EDS), and mechanical testing. He has technical training and teaching experience in mechanics, machining, and welding.

Areas of Specialization

Failure Analysis

Metallurgy and Materials Analysis

Automobile and Heavy Truck Accident Investigation

Industrial Machinery Failure and Accident Analysis

Fire and Explosion Investigation

Aircraft Accident and Failure Investigation

Welding, Piping, Boilers, and Pressure Vessels

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Education

Masters Metallurgical and Materials Engineering, Illinois Institute of Technology - Chicago
B.S., Metallurgical Engineering, University of Illinois -Urbana
B.S., Industrial Education, Machine Tool and Automotive Technology, Illinois State University-Normal

Licensed Professional Engineer (P.E.)

State of Missouri License No. 2005013553
State of Illinois License No. 062-048130
State of Texas License No. 87110
State of Kansas..... License No. 20292

Certifications

Certified Fire and Explosion Investigator (CFEI), NAFI 14570-7439v
Certified Vehicle Fire Investigator (CVFI), NAFI 14570-7439v

Professional Affiliations/Honors

ASM International

Member, Executive Committee and Past Chairman, Chicago Western Chapter, 1989 –1994

American Society of Mechanical Engineers (ASME)

Pressure Vessel and Piping; M&F Subcommittee, Past Vice Chairman, 1995

American Society of Testing and Materials (ASTM)

ASTM F.08-Trampolines Committee Member/Task Force Subcommittee, 1999

Society of Automotive Engineers (SAE)

Member

National Association of Corrosion Engineers (NACE)

Member

National Association of Fire Investigators (NAFI)

Member

Positions Held

Engineering Systems Inc., O'Fallon, MO

Senior Consultant, 2003 - Present
Manager of Missouri Operations, 2012 – Present

Materials Analysis, Inc., Dallas, TX

Staff Engineer, 1995 - 2003

Packer Engineering, Inc., Naperville, IL

Staff Engineer/Senior Staff Engineer, 1988 – 1995

Northern Illinois University, DeKalb, IL

Guest Lecturer, 1988 – 1995

Lewis and Clark Community College, Godfrey, IL

Part Time Instructor, Welding Technology, 1980 – 1984

Jersey Community Unit School District No. 100, Jerseyville, IL

Teacher, Industrial Education, Machine Tool and Welding Technology, 1980 –1984

Continued Education

Fatigue Analysis Seminar

University of Illinois, Urbana, IL 1990

Corrosion Control

Nickel Development Inst., Naperville, IL, 1991

Ultrasonic Inspection Level II Certification

MQS Corporation, Elmhurst, IL, 1994

Truck Air Brake Systems Training

Allied Signal Co., Dallas, TX, 1998

Traffic Accident Investigation

Northwestern University Traffic Institute, 1998

Traffic Accident Reconstruction

Northwestern University Traffic Institute, 1998

Fire and Materials 9th Intl. Conference

Interscience Communications, Ltd, San Francisco, CA, 2005

Vehicle Accident Reconstruction Methods

SEA Intl., Ft. Myers, FL, 2006

Forensic Fire Scene Reconstruction

IAAI, Orlando, FL, 2008

Fire, Arson & Explosion Investigation Training Program

NAFI, Denver, CO, 2009

Fire Investigation Training

Kansas City Arson Task Force, 2012

Vehicle Fire Investigation and Arc Mapping

CFITrainer.net, 2014

Vehicle Fire Investigation Training and Certification

NAFI, 2015

Evidence Examination; What Happens at the Lab

CFITrainer.net, 2015

Documenting the Event

CFITrainer.net, 2017

Publications/Presentations

“Short Term Failure of Carbon Steel Boiler Tube”, **C. C. Bigelow**, Handbook of Case Histories in Failure Analysis, ASM International, Edited by Khlefa Esaklul, 1994

“Safety Glasses: Preventing Eye Injuries from Carbide Tips,” S.A. Sanders, **C. C. Bigelow** and F.E. Schmidt, Professional Safety, April 2015

Technical Teaching and Presentations

“Metallurgy and Material Processes”

Instructor of undergraduate course, Northern Illinois University, DeKalb, IL, 1988 –1995

“Metallurgy and Materials”

Training module for the Electric Power Research Institute, Charlotte, NC, 1992

“Metallurgy for the Non-Metallurgist”

ASM/MEI Continuing Education Course, Naperville, IL, 1991–1994

“Failure Analysis”

ASM/MEI Continuing Education Course, Naperville, 1992

“Electron Microscopy in Failure Analysis”

Teacher Training Seminar, Argonne National Laboratory, Argonne, IL, 1993

“Failure Analysis”

Savannah River Chapter of ASM, Savannah, SC, 1991

“Case Studies in Failure Analysis”

St. Louis Chapter of ASM International, St. Louis, MO, 1994

“Failure Analysis Techniques”

ASM Materials Solutions Conference, St. Louis, MO, 2000

“Damage Analysis of Plain Bearings in Aircraft Engines”



MS&T Materials Conference, Cincinnati, OH, 2006

“Performance of Protective Eyewear in Preventing Ocular Injuries”

Missouri CLE presentation, Cape Girardeau, MO, 2016

Patents

U.S. Patent No. 5,476,429. Co-inventor of the Wheelchair Aerobic Fitness Trainer, an ergometer and diagnostic machine for wheelchair users, developed under contract with the Veterans Administration.