



Applied Materials Technologies Inc.

A professional design and engineering firm

ROBERT P. O'SHEA, JR. P.E.
PRINCIPAL ENGINEER AND SR. METALLURGICAL ENGINEER

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EDUCATION

M.S. Material Science and Engineering
University of Notre Dame, 1986

B.S. Metallurgical and Material Engineering
Illinois Institute of Technology, 1984

REGISTERED PROFESSIONAL ENGINEER (P.E.)

State of Illinois	License No. 062-057825
State Of Arkansas	License No. 13469
State of Wisconsin	License No. 33658-6

AREAS OF SPECIALIZATION

Accident Reconstruction
Code & Standard Compliance Issues
Material Failure Analysis & Metallurgical Testing
Fire Cause and Origin (Commercial and, Residential)
Utility Investigations (Gas, Electric and Steam)
Gas Turbines
Underwater Structural Inspection Management
Boiler Failures including Refractory and Brick System Failures
Fitness for Service Evaluations
Marine Investigations

Mr. O'Shea is a Principal Engineer and Senior Metallurgical Engineer at Applied Materials Technologies Inc. and has over 30 years' experience in comprehensive failure analysis investigations. These investigations include field project management, utility gas electric and steam investigations, gas turbines, petroleum refineries accident investigation, code compliance (industrial and marine), maintenance, marine failure analysis and engineering, materials engineering, welding technologies, accident reconstruction, fire cause and origin determination (NFPA 921) and corrosion (NACE Standards). Mr. O'Shea has been the lead engineer (Project Manager) on over 150 forensic inspections and assisted on over 200 forensic inspection aimed at determining the cause of failures and accidents. Mr. O'Shea has conducted projects ranging from simple failure investigations to complex engineering studies. He has also performed detailed, quantitative risk assessment analyses for a variety of different clients for risk mitigation situations. Specific investigations have involved failed boilers, refractory and brick systems, generators, transformers and breakers (NFPA 70, NFPA 85 and IEEE standards). Mr. O'Shea involvement

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in the petrochemical industry includes issues related to Process Safety Management (OSHA PSM) covering Process Hazards Analysis, Management of Change, Mechanical Integrity, Accident Investigations, Valve Testing (API 598 and API 607), Emergency Plans and Response, Training, and Compliance Audits as well as reliability studies, risk analysis, QA/QC and safety assessments or audits. He has addressed many issues relate to code compliance. He is familiar with most codes including ASME, ASM, ANSI, API, AWS, IBC, NACE, and DOD.

As a part of the many comprehensive failure analyses, Mr. O'Shea has developed numerous protocols for the examination and testing of evidence both on-site as well as in testing laboratories. He has directed and coordinated the execution of these protocols to obtain the necessary test results. These test protocols have contributed to investigations involving fires, gas explosions, dust explosions, incidents in a variety of process plant operations, boiler explosions, utility explosions (gas and electric) and the investigation of incidents in other industrial systems. Specific protocols have involved functional tests of systems that include heat exchangers, control valves, block valves, check valves, filtration systems and pump motors. Mr. O'Shea has developed metallurgical testing protocols which entails a complete examination (visual and microscopic) and documentation of the evidence, metallurgical sampling, fracture surface examination, hardness testing, mechanical testing and destructive testing. These metallurgical examinations include the use of metallographs, stereo microscopes, scanning electron microscope (SEM), and energy dispersive spectroscopy (EDS) analysis equipment. Mr. O'Shea has designed and conducted specialized testing and evaluation examinations to either validate or refute proposed hypothetical theories of causation during failure analysis investigations. Mr. O'Shea also offers extensive experience in the design and use of video and technical computer graphics for legal presentations.

Mr. O'Shea has been the Project Manager on over fifty underwater condition assessments throughout the Midwest. Concurrently, for the last twenty one years he has been actively involved in consulting engineering. During that time, he has developed and directed numerous construction quality assurance audits on multi-million dollar projects throughout the United States.

Prior to AMTI, Mr. O'Shea was a senior consultant and held numerous other positions at Engineering Systems Inc. (ESI), a professional engineering consulting firm and laboratory headquartered in Aurora, Illinois. ESI is a multi-disciplinary company, which provides professional engineering services to industrial, legal and insurance firms, government agencies and trade organizations. In addition, ESI often provides engineering consulting services to other engineering firms. The laboratory capabilities are supplemented by cooperative agreements with other recognized facilities to provide a wide range of technical support capabilities, including metallurgical, materials, aeronautical, mechanical, biomechanical, structural, electrical, safety, automotive and audio/visual services. Mr. O'Shea has conducted projects ranging from simple failure investigations to complex engineering studies. These included utility and industrial boilers, turbines, scrubbers, pressure vessels, transformers, generators, breakers, petrochemical processes, natural gas transmission systems, alternate energy sources, safety, training, etc., as well as projects involving consumer products.

Mr. O'Shea's formal education is in materials and metallurgical engineering. He is familiar with material design, manufacturing, and performance in a variety of applications. He is a Past Director of the Illinois Committee on Arson Prevention, and has considerable experience in the determination of fire cause and



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origin.

Mr. O'Shea spent 3 years with Northrop Corporation as a Senior Engineer, responsible for mechanical design and Code Compliance (Military Standards and DOD Standards)) of state-of-the-art manufacturing, processing techniques, and systems. Prior to Northrop, he was a Materials Science Engineer at L.J. Broutman and Associates, Ltd. where he was responsible for investigations of failures in plastics, polymers, composites and metal products. Mr. O'Shea was an Engineering Technician at Anixter Mark, where he was involved in the testing and manufacturing of communication antennas.

Mr. O'Shea has made numerous presentations at technical meetings and conferences in the areas of code compliance, material characteristics, vehicle fires, utility and industrial plant fires and investigative tools and technology techniques. He has taught laboratory courses at the University of Notre Dame and Georgia Tech. He is a Hazwoper Site Supervisor, Confined Space Attendant and Entrant Supervisor.

Professional Affiliations/Honors

National Society of Professional Engineers - Member

Illinois Committee on Arson Prevention (ICAP) – Past Director

Chicago Chapter American Society of Metallurgical Engineers (ASM)

Vice Chairmen (2014/2015)

Past Committee Member

Western Loss Association - Member

American Institute of Chemical Engineers (AIChE) - Member

National Fire Protection Association (NFPA) -Member

ASM International

MT&QCTS Failure Analysis Committee – Voting Member

ASM Handbook Committee Officer – Past Secretary and Member

Continued Technical Education

Additional Graduate Work: Mechanical and Material Engineering Courses
Illinois Institute of Technology and Georgia Institute of Technology

Life Safety Code 101 Training: Three Day Course
National Fire Protection Association, 2002

OSHA Hazwoper Health & Safety Training: 8 Hour Update Course
Wheaton, IL, 2001, 2002, 2003, 2004, 2007



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Gasoline Engines: 40 Hour Course
American Boat & Yacht Council, Inc., 2000

Lean Operations Management Principles and Practices
Aurora University, 2000

Automatic Sprinkler Systems Training: Three Day Course
National Fire Protection Association, 1999

OSHA Hazwoper Health & Safety Training: 40 Hour Course
Engineering Systems Inc., 1998, 2006
8 Hour Refresher 1997-2005 and 2007-2015

Traffic Accident Reconstruction 1 & 2
Northwestern University Traffic Institute, 1996

Fire and Explosion Hazards Course
American Institute of Chemical Engineers, 1994

National Electrical Code Workshop
National Fire Protection Association, 1993

Finite Element Modeling Advance Workshop
Dynatech Analysis Corporation, 1992

Vehicle Fires and Explosions Course
University of Wisconsin, 1991

Electrical Fires for the Non-Electrical Engineer
Hughes Institute for Continuing Education, 1990

Computer Skills

Extensive knowledge of personal computers, including Microsoft programs, WordPerfect, Mathcad, Corel Draw, AutoCAD and Adobe Photoshop drawing and editing programs.

Positions Held

Applied Materials Technologies, Inc., Naperville, Illinois
Principal Engineer, 2001 – Present
Founder, 2001



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Engineering Systems Inc., Aurora, Illinois

Senior Consultant 2008-2009

Consultant, 2001-2008

Senior Staff Engineer, 1989-2001

Northrop Corporation, Rolling Meadows, Illinois

Senior Engineer, 1986-1989

L. J. Broutman and Associates, Ltd., Chicago, Illinois

Materials Science Engineer, 1983-1984

Anixter Mark, Des Plaines, Illinois

Technician, 1982-1983

Publications, Papers, and Lectures

Sometimes, Even the Very Best Welds Will Fail

ASM International Failure Analysis Program: MS&T 2015 Columbus, Ohio

Movable Platform Guardrail Failure Investigation

ASM International Failure Analysis Program: MS&T 2015 Columbus, Ohio

Corrosion - The Role of Corrosion in Premature Failures

ASM International Montreal Canada October 2013 Meeting

Engineering Technology and Litigation

Northern Illinois Adjustor Association, Rockford IL, Spring 2012 Meeting

Material Signature of Fires

American Institute of Chemical Engineers (AIChE) - Midwest Regional Conference, Chicago IL, 2010

Corrosion of Springs - The Role of Corrosion in Premature Failures And the Means to Prevent Those Failures

Spring Manufacturers Institute Conference, Las Vegas Nevada Fall, 2009

Vehicle Fires

Chrysler Corporation, Pontiac Michigan, Fall 2008

Flex Connectors Failures

Natural Gas Litigation Conference, 2005

Incendiary Automobile Fires Origin and Cause Determination

International Association of Special Investigation Units, Louisiana State Chapter, 2003

Engineering Technology in Product Liability Litigation

Natural Gas Claims and Litigation Association Annual Meeting Orlando FL, April 2002



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Fire Investigations from a Metallurgical Perspective

Illinois Committee on Arson Prevention (ICAP), Fall Meeting 1996

Materials Signature of Fires

ASM International Cleveland Ohio, October 1992

