



Metallurgical Air Safety Investigations, LLC

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Keith A. McMinn, M.S., P.E.

Curriculum Vitae

PRIMARY INTERESTS:

Metallurgical and Materials Engineering Consulting, Forensic Metallurgy, Failure Analysis, Aircraft Accident Investigation, Turbine Engine Accident Investigation, Aircraft and/or Turbine Engine Fire Investigations, and Training in Structures & Metallurgy, Failure Analysis, and Accident Investigation.

EDUCATION:

1992: Master of Science Materials Engineering, University of Oklahoma, Norman Ok.
1982: Bachelor of Science Metallurgical Engineering, University of Oklahoma, Norman Ok.
1978: Graduate of Welding, Southern Oklahoma Area Vo-Tech Center, Ardmore, Ok.

PROFESSIONAL REGISTRATION(S):

2016: Licensed Certificate of Authorization in the State of Oklahoma-Metallurgical Air Safety Investigations, LLC
dba MetASI, CA 7723 (PE)
1992: Licensed Professional Engineer in the State of Oklahoma-Metallurgical Engineering, PE 17166

EXPERIENCE:

Jan 2015 to Present: Consulting Engineer
Metallurgical Air Safety Investigations, LLC
Norman, OK 73026

Mr. McMinn is a Consulting Engineer having started MetASI, LLC (Metallurgical Air Safety Investigations, LLC) upon retiring from the U.S. Department of Transportation. Mr. McMinn specializes in Metallurgical and Materials Consulting, Forensic Metallurgy, Failure Analysis, Aircraft Accident Investigation, Turbine Engine Accident Investigation, Aircraft/Turbine Engine Fire Investigations, and Training in Structures & Metallurgy, Failure Analysis, and Accident Investigation. Clients include Civil, Military, and Private Organizations; the FAA, the NTSB, the U.S. Air Force, the U.S. Army, Aerospace Manufacturers, Aviation Law Firms, and Educational Institutions both domestic and international.

Jul 1999 to Dec 2015: Senior Air Safety Investigator/Instructor
U.S. Department of Transportation
Transportation Safety Institute
Aviation Safety Division
Oklahoma City, OK 73169

Mr. McMinn was a Senior Air Safety Investigator /Instructor in the Department of Transportation's Transportation Safety Institute (TSI) Aviation Safety Division located at the Mike Monroney Aeronautical Center (MMAC) in Oklahoma City, Oklahoma; retiring on January 2, 2015 with 31 years and 9 months of Federal Service. The Aviation Safety Division conducts Aviation Safety (AS) and Aircraft Accident Investigation (AAI) training for all of the Federal Aviation Administration's (FAA) Aviation Safety Inspectors as well as other Government, Military, Industry, and Foreign Investigators.

Mr. McMinn was an Associate Staff Member from May 1994 to July 1999 and a Staff Member from July 1999 to January 2015. His primary work at TSI consisted of course design, instruction, and management. Course design included the Basic AAI, Advanced AAI, Experimental AAI, Turbine Engine AI, Human Factors in AAI and various International AAI courses. Instruction included technical lectures in structures and properties of materials, physical metallurgy, failure analysis of aircraft and turbine engine components, crash site diagramming/analysis, crash site photography (digital), aircraft reconstruction/analysis, turbine engine investigations, composite investigations, aircraft system investigations, in-flight breakup investigations, mid-air collision investigations, and in-flight/post impact fire investigations. Course management included the Basic AAI, Advanced AAI, Experimental AAI, Turbine Engine AI, Human Factors in AAI, and International AAI courses.

While at TSI Mr. McMinn stayed current as an Air Safety Investigator by assisting the FAA's Flight Standards District Offices and the NTSB's Regional Offices in performing General Aviation Aircraft Accident Investigations (Beech, Cessna, and Piper, etc.). Mr. McMinn was considered a "National Resource" by the FAA's Aviation Safety Inspectors due to his specialized knowledge and skills in metallurgy, failure analysis, and aircraft accident investigations and was routinely consulted to help with complex investigations.

Mar 1983 to Jul 1999: Senior Materials Engineer
U.S. Department of Defense
U.S. Air Force, Oklahoma City Air Logistics Center
Materials Engineering Laboratory
Midwest City, OK 73145

Mr. McMinn was a Senior Materials Engineer in the Department of Defense's U.S. Air Force Oklahoma City Air Logistics Center's (OC-ALC) Materials Engineering Laboratory located at Tinker AFB, Ok. Tinker AFB is one of three Air Force Depots responsible for repair and overhaul of aircraft and turbine engines. The Materials Engineering Laboratory conducts aircraft and turbine engine failure analysis and accident investigations. Mr. McMinn's work at Tinker AFB consisted of forensic metallurgy, failure analysis, and aircraft accident investigations on USAF weapon systems; both aircraft and turbine engines. These investigations consisted of site documentation with sketches and photography, crash dynamics and aircraft reconstruction, in-flight/post impact fire analysis, failure analysis of both metallic and composite components, turbine engine failure analysis and investigations, laboratory testing, and technical report writing. Crash Investigations included the majority of modern day Air Force aircraft; A7, A10, ALCM, B-1B, B-52, C-5, C-141, E-3, F-4, F-14, F-15, F-16, F-105, F-111, KC-10, KC-135, T-33, T-37, T-38, U-2 and their corresponding engines being managed and overhauled at OC-ALC.

Aug 1981 to Dec 1982: Metallurgical Laboratory Technician
Associated Metallurgists
Norman, OK 73169

Mr. McMinn was a Metallurgical Laboratory Technician in the laboratory of Associated Metallurgists located at the University of Oklahoma; Norman, Ok. Associated Metallurgists was a Metallurgical Engineering Consulting firm consisting of two University of Oklahoma Professors in Metallurgical Engineering specializing in Forensic Metallurgy and Failure Analysis. Workload consisted largely of failed components from the Oil and Gas Industry as well as failed components from other Industries involved in litigation. Mr. McMinn's laboratory work at Associated Metallurgists consisted of shooting, developing, and printing macro and micro photographs of failed components; cutting, mounting, polishing, and etching metallurgical samples; and macro and micro hardness testing of failed components.

May 1982 to Aug 1982: Non-Destructive Inspection Technician
Fox Corporation
Oklahoma City, Ok, 73119

Mr. McMinn was a Non-Destructive Inspection Technician in the field and shop of Fox Corporation located in SW Oklahoma City, Ok. Fox Corporation was a Non-Destructive Inspection (NDI) shop specializing in NDI of tubular products utilized in the Oil and Gas Industry; drill pipe, collars, reamers, bits, etc. Mr. McMinn's work at Fox Corporation consisted of preparation and inspection of tubular products utilizing dye penetrant, fluorescent penetrant, magnetic particle, magnetic induction, and ultrasonic inspections.

May 1981 to Aug 1981: Welder
Paul's Welding Service
Oklahoma City, Ok, 73149

Mr. McMinn was a Welder in the fabrication shop of Paul's Welding Service located in SE Oklahoma City, Ok. Paul's Welding Service was a fabrication shop specializing in constructing complete drilling platforms utilized in the Oil and Gas Industry; sub-structures, dog houses, drilling floors, derricks, mud pits, etc. Mr. McMinn's work at Paul's Welding Service consisted of reading blueprints, gathering materials, cutting and fitting parts, and laying out and welding parts from the "raw" material to the finished product. Cutting consisted of both automated and manual oxy-acetylene cutting and welding consisted of both metal inert gas welding (MIG) and shielded metal arc welding (stick) of carbon steel raw materials in all positions.

May 1980 to Aug 1980: Welder/Laborer
May 1979 to Aug 1979: Washita Construction Company
Ardmore, Ok, 73401

Mr. McMinn was a Welder/Laborer for Washita Construction Company located in Ardmore, Ok. Washita Construction Company was a road construction company specializing in asphalt road construction in the Transportation Industry. Mr. McMinn's work at Washita Construction Company consisted of repair welding, maintenance, and operation of road construction equipment and basic labor during road construction. Repair welding consisted of both oxy-acetylene cutting and brazing and shielded metal arc welding (stick) of carbon steel road construction equipment; front end loaders, graders, lay down machines, rubber tire rollers, and steel wheel rollers.

Jan 1978 to Aug 1978: Welder
May 1977 to Aug 1977: Spade Engineering and Manufacturing Corp.
Springer, OK, 73458

Mr. McMinn was a Welder in the fabrication shop of Spade Engineering and Manufacturing Corporation located in Springer, Ok. Spade Engineering and Manufacturing Corporation was a fabrication shop specializing in constructing frac tanks and vacuum transports utilized in the Oil and Gas Industry. Mr. McMinn's work at Spade Engineering and Manufacturing Corporation consisted of reading blueprints, gathering materials, cutting and fitting parts, and laying out and welding parts from the "raw" material to the finished product. Cutting consisted of both automated and manual oxy-acetylene cutting and welding consisted of both metal inert gas welding (MIG) and shielded metal arc welding (stick) of carbon steel raw materials in all positions.

MEMBERSHIPS IN TECHNICAL SOCIETIES:

ISASI: International Society of Air Safety Investigators
GAASI: General Aviation Air Safety Investigators
MASI: Military Air Safety Investigators
ASM: American Society of Materials
AWS: American Welding Society

PRESENTATIONS AND CONFERENCE PARTICIPATION:

General Aviation Air Safety Investigators Technical Workshop 2000, Wichita, KS
Digital Photography in Aircraft Accident Investigations
General Aviation Air Safety Investigators Technical Workshop 2003, Wichita, KS
Metallurgy of Aerospace Aluminum Alloys 1903-2003
General Aviation Air Safety Investigators Technical Workshop 2004, Wichita, KS
Metallurgy of Aircraft Quality Steels
General Aviation Air Safety Investigators Technical Workshop 2005, Wichita, KS
Failure Analysis-Failure Mode Identification
General Aviation Air Safety Investigators Technical Workshop 2006, Wichita, KS
NTSB-FAA-Military Investigations
International Society of Air Safety Investigators 2008 Annual Seminar, Halifax, NS
Data Collection of A/C Wreckage in GA Aircraft Accident Investigations
United States Society of Air Safety Investigators 2010 Seminar, Oklahoma City, OK
Aircraft Accident Investigation Boneyard Instruction
General Aviation Air Safety Investigators Technical Workshop 2010, Wichita, KS
Electronic Crash Site Documentation/Data Collection in Aircraft Accident Investigations
Blaze Tech's Aircraft Fire and Explosion 2011 Seminar, Woburn, MA
Aircraft and Turbine Engine Metallurgy and Failure Analysis
Military Air Safety Investigators 2012 Seminar, Phoenix, AZ
Joint Investigations-Military and Civil Aircraft Accident Investigations
Oklahoma City Flight Standards District Office 2012 Inspection Authorization Seminar, Oklahoma City, OK
Beech K35 Accident Case Study
International Society of Air Safety Investigators 2012 Annual Seminar, Baltimore, MD
Basic Failure Analysis-Failure Mode Identification at the Accident Site
International Society of Air Safety Investigators 2013 Annual Seminar, Vancouver, BC
Hazards of Composite Materials in Aircraft Accident Investigations
International Society of Air Safety Investigators 2013 Annual Seminar, Vancouver, BC
Training the "Stakeholders" Government and Industry Investigators
Interagency Committee for Aviation Policy 2014 Aviation Safety Officer Workshop, Oklahoma City, OK
Aging Aircraft Accidents due to Human Factors-Maintenance
Military Air Safety Investigators 2016 Seminar, Albuquerque, NM
Case Study: A Tail of Two KC-135R's Decompression or In-Flight Break-Up

PUBLICATIONS AND REPORTS:

International Society of Air Safety Investigators 2008 Annual Seminar, Halifax, NS
Data Collection of A/C Wreckage in GA Aircraft Accident Investigations
International Society of Air Safety Investigators 2012 Annual Seminar, Baltimore, MD
Basic Failure Analysis-Failure Mode Identification at the Accident Site
International Society of Air Safety Investigators 2013 Annual Seminar, Vancouver, BC
Hazards of Composite Materials in Aircraft Accident Investigations
International Society of Air Safety Investigators 2013 Annual Seminar, Vancouver, BC
Training the "Stakeholders" Government and Industry Investigators

CONTINUING ENGINEERING EDUCATION:

Metallurgy of Welding, Feb 1985, OSU, Columbus, OH
Aircraft Corrosion Control, USAF, Sept 1985, Tinker AFB, OK
Jet Engine Accident Investigation, Jan 1986, USAF, Chanute AFB, IL
Metallographic Preparation of Composite Materials, Mar 1986, ASM, Monrovia, CA
Aircraft Composites I & II, Jul 1986, ASM, Tinker AFB, OK
Aircraft Accident Investigation, Feb 1987, Transportation Safety Institute, Oklahoma City, OK
Jet Engine Systems and Operating Principles, Aug 1987, USAF, Tinker AFB, OK
B-1B Advanced Material Repair for Engineers, Oct 1987, Rockwell, Tinker AFB, OK
Fundamentals of Welding Engineering, May 1988, OSU, Columbus, OH
Aircraft Accident Investigation, Dec 1988, USAF, Norton AFB, CA
Energy Dispersive Spectrographic Analysis, Kevex, Sept 1991, San Francisco, CA
Aircraft Fire Mishap Investigation, Aircraft Fire Protection Associates, Mar 1992, Dayton, OH
Failure Analysis Preparation for Litigation, America Society of Metals, Jun 1992, Metals Park, OH
Role of the Technical Witness in Aviation Litigation, University of Southern California, Jan 1994, Los Angeles, CA
Legal Aspects of Aviation Safety, University of Southern California, Nov 1994, Los Angeles, CA
Modern Furnace Brazing, WC, May 1995, Detroit, MI
Rotorcraft Accident Investigation, Transportation Safety Institute, Apr 1996, Dallas, TX
Advanced Aircraft Accident Investigation, Transportation Safety Institute, Jan 1997, Oklahoma City, OK

High Reliability Soldering, Nov 1997, USAF, Tinker AFB, OK
Human Factors in Aircraft Accident Investigation, Transportation Safety Institute, May 1998, Oklahoma City, OK
Jet Engine Mishap Investigation, Feb 2000, USAF, Sheppard AFB, TX
Photographic Documentation, National Transportation Safety Board, May 2005, Washington, D.C.
Aviation Technician Advanced Training, TCM, May 2006, Mobile, AL
Advanced Composite Structures I, Abaris, May 2007, Reno, NV
Advanced Composite Structures II, Abaris, Jan 2010, Reno, NV
EAA SportAir Workshop-Sheet Metal, EAA, Mar 2010, Dallas, TX
EAA SportAir Workshop-TIG Welding, EAA, Apr 2011, Griffin, GA
Aircraft Fire & Explosion, BlazeTech, May 2006, Woburn, MA
EAA SportAir Workshop-Electrical Systems, EAA, Jun 2014, Dallas, TX