

ROBERT McCABE  
AMC  
931 N. State Road 434  
Suite 1201 - #189  
Altamonte Springs, FL 32714

## **ROBERT McCABE, PE**

Professional experience includes 25 years in the materials, failure analysis, metallurgical, and welding engineering fields. Solved materials engineering problems and performed failure analysis on components from petrochemical plants, oil and gas transmission pipelines, offshore structures, ships, industrial machinery, food processing equipment, pharmaceutical plants, gas turbine engine components, automotive components, aircraft, aerospace vehicles, and weldments.

## **EDUCATION**

Massachusetts Institute of Technology  
1981 MS, Metallurgy  
Thesis: "Creep Crack Growth in Rene 95 at 650 and 760 °C"

Rensselaer Polytechnic Institute  
1979 BS, Materials Engineering  
Minor in Economics

## **HONORS**

Graduated Magna Cum Laude  
Tau Beta Pi (Engineering)  
Alpha Sigma Mu (Materials Science and Engineering)

## **LICENSE**

Registered Professional Engineer State of Florida

## **INDUSTRIAL EXPERIENCE**

- Failure analysis
- Oil and gas pipe lines
- Mechanical testing
- Ships
- Heat treatment
- Quality assurance audits
- Aircraft / Aerospace
- Pharmaceutical plants
- Petrochemical plants
- Gas turbine engine components
- Welding and weld evaluation
- Automotive components
- Weld procedure qualification
- Nondestructive evaluation
- Metallurgical engineering
- Fracture mechanics evaluation
- Food service industry
- Materials selection & processing

## **PROFESSIONAL EXPERIENCE**

Independent consultant providing materials and metallurgical failure analysis, welding, materials processing, corrosion, litigation consulting, accident investigation, forensic engineering, testing, inspection, and metallurgy services. Materials and metallurgical consulting services are provided to solve industrial processing problems, failure analysis, and for litigation support.

Acted as metallurgical and welding technical consultant to corporate engineering and construction fabrication facilities worldwide. Conducted metallurgical failure analyses of ships, industrial equipment, as well as oil and gas transmission pipe lines. Established welding procedures and provided technical direction for mechanical and nondestructive testing of weldments. Evaluated welding consumables and automated welding equipment. Developed welding procedures for both pipelines and offshore structure construction. Performed mechanical testing and metallurgical evaluation of offshore structures and pipelines. Responsible for dye penetrant, magnetic particle, ultrasonic, and radiographic inspection of offshore structures and pipelines. Responsible for characterizing and optimizing metallurgical and mechanical properties for the prototype flash butt welding project. This also included enhancing the mechanical properties and nondestructive inspection capability of flash butt welds.

Provided technical leadership for failure analysis, fracture mechanics assessment, welding, nondestructive inspection and testing. Developed welding procedure qualifications for critical welds including attachment points for aircraft stores. Provided expertise and technical support in evaluation and selection of materials, welding, heat treatment, soldering, brazing, plating and surface coatings, mechanical testing, materials and process design changes, manufacturing engineering, metallurgical processing, and related areas. Provided problem identification and solutions for failures, stress corrosion cracking, fatigue, dissimilar metal corrosion, galling, wear, weld cracking, and evaluation of various weldment or component defects effects on remaining useful life. Served as consultant and worked closely with customer and contractors' engineering representatives. Evaluated nondestructive inspection of aircraft and aircraft stores, including radiographic, ultrasonic, magnetic particle, fluorescent particle, dye penetrant,

visual and eddy current inspection of components. Evaluated and solved material problems on castings, forgings, powder metals, weldments, fiber reinforced metal matrix composites, polymeric materials, fiber reinforced polymer matrix composites, electronic boards and solder joints of aerospace and ground support equipment. Developed alternatives to materials and processing procedure issues in production, and maintenance. Engineering assessment of fracture mechanics analysis of critical airframe components and weldments.

Managed division's heat treatment facilities, and metallurgical analysis laboratory, as well as dimensional and nondestructive inspection staff. Developed welding procedures and heat treatment procedures for titanium, stainless steel and nickel base super alloy components for jet engines. Project assignments included enhancing brazing, thermal spraying, forming, electrodischarge machining and chemical milling of components. Acted as technical liaison with customers' engineering representatives to assure product met metallurgical requirements for aircraft engine components. Conducted metallurgical failure analyses and acted as metallurgical consultant for the corporation.

Characterized material properties of adhesives, polymers, and metallic materials at the Corporate Materials Research and Development Division. Evaluated metallic and nonmetallic materials for use in wide range of manufactured components produced at multiple plant sites.

## **PROFESSIONAL ASSOCIATIONS**

ASM International (The Materials Information Society)  
National Association of Corrosion Engineers (NACE)  
American Welding Society (AWS)

## **COMMITTEE MEMBERSHIP**

American Welding Society  
Member of the B1 Committee on Methods of Inspection

## **PUBLICATIONS, COURSES AND SEMINARS PRESENTED**

Scanning Electron Microscope theory and laboratory at MIT

Heat Treatment theory and laboratory at MIT

Mechanical Properties of Materials Seminar presented at Structure and Materials Workshop 1991, Eglin Air Force Base

Mechanical Metallurgy Principles presented at Mobile Chapter of American Institute of Chemical Engineers 1998

"Practical Aspects of Industrial Sulfuric Acid Corrosion" presented at American Institute of Chemical Engineers Central Florida Section, 1999 Clearwater Convention

"Metallurgical and Processing Issues for Brazing & Soldering" presented at Society of Manufacturing Engineers Brazing and Soldering Technologies Seminar February 2002

Post-Failure Evaluation of Mechanical Properties: A Primer, Practical Failure Analysis  
Volume 2(6) December 2002

**COURSES AND SEMINARS ATTENDED** (incomplete)

Two-week intensive version of Ohio State University Welding Engineering Course

Nondestructive Inspection Seminar Cosponsored by The Welding Institute (UK)

Other Nondestructive Inspection Seminars

Explosive Safety and Damage Seminars

Hazardous Materials Seminars

Materials and Metallurgical Engineering Seminars

Edison Welding Institute Welding Seminar

Casting Tools for Process Development Workshop presented by the National Center for Excellence in Metalworking Technology