

SYA ENSHA. PH.D.

EDUCATION

Ph.D., Metallurgy & Metal Processing, Department of Materials Science & Engineering • University of California, Los Angeles

M.S., Physical Metallurgy, Department of Metallurgical Engineering • Michigan Technological University

B.S., Engineering, School of Engineering • University of Tehran, Iran

EXPERIENCE

2012 – PRESENT

Director – Metallurgy and Materials Science • EAG Laboratories

2003-2012

Director – Metallurgy and Materials Science • SEAL Laboratories

1990-2012

Senior Member of Technical Staff • SEAL Laboratories

1987-1990

Metallurgist/Failure Analysis Specialist • LRA Laboratories, Inc.

- Engineering support in metallurgy and materials to solve manufacturing, design, service and maintenance problems
- Failure analysis and fracture mechanics
- Hydrogen embrittlement in fasteners
- Failure investigation of Haynes 25 Bjork-Shiley heart valves
- Hydrogen embrittlement and stress corrosion cracking research activities
- Training and guidance of junior engineers

1985-1987

Visiting Scholar/Lecturer • Department of Material Science & Engineering, School of Engineering & Applied Science

- Research on feasibility of using acoustic emission for predicting remaining life of creep damaged boiler tubes
- Taught "Science of Engineering Materials" and "Materials Selection and Engineering Design"
- Taught two graduate courses at USC Department of Mechanical Engineering in 1987-1988 entitled: Fracture & Fatigue, I and II

1974-1985

Assistant Professor of Metallurgy • Department of Metallurgical Engineering, Sharif University of Technology (Formerly Arya Mehr University of Technology), Tehran, Iran

- Vice Chairman 1978-82
- Institute of Research and Standards of Iran, 1974-1977, served as metallurgical expert on several committees
- Applied Research Center of Iran, 1975-1977 and 1982-1984, served as non-destructive testing consultant; also taught courses on radiography and ultrasonic testing to engineers
- Machine Sazi Arak, Pressure Vessel Division, 1975-1977, consulting on radiography of pressure vessels
- Iranian Helicopter Support and Innovation, 1980-1985, served as metallurgical consultant on

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1969-1974

failure analysis

- Electric Power Research Center, 1982-1985, served as chief metallurgical consultant. Failure analysis of power generating components, selection of materials and manufacturing evaluation. Extensive failure analysis of boiler tube issues such as water wall and superheaters. Other problems examined at EPRC included boiler circulating pumps and feedwater pumps, electric power transmission components
- Courses taught at Sharif University of Technology: Advanced Mechanical Metallurgy, Mechanical Metallurgy, Fracture and Failure Analysis of Engineering Components, Nondestructive Evaluation, Theory of Dislocations. X-ray Metallography, Solidification of Metals, and Phase Transformations

Staff Research Associate • Department of Materials Science & Engineering, School of Engineering & Applied Science, University of California, Los Angeles

- Research on the Effects of Microstructure on the Fracture Toughness of Low Alloy Steels (Mild Steels, Low Carbon Steels, Fully Pearlitic Steels and Quenched & Tempered 4340 Steels

Teaching Assistant • Michigan Technological University, Houghton, Michigan

- Teaching Assistant on Failure Analysis Course, Obtained failed engineering components from the industry for the class work shop and worked with students on various modes of failure and practiced the failure analysis methodology

1968-1969

SKILLS

Expertise in failure analysis of metallic materials, engineering plastics and ceramics, including:

- Metallurgical investigation of the failures caused by defects in manufacturing such as heat treatment, castings and metal forming, fastener & Bolting, welding, brazing and soldering joints.
- Failure analysis of consumer goods from electric water heaters to toys.
- Examination of failed components transportation industry; from trucks & automobiles to aero-engines such as compressor blades failures due to FOD and thermomechanical fatigue in hot section turbine.
- Failure analysis of components such as axels, shafts, gears and bearings and suspension related to automotives to; landing gears, gear housings, components from aircraft; hydraulic system such as anti-skid brake system, hydraulic system manifolds and filter housing; LVDT and temperature sensors, poppet valve seats with ruby balls and high pressure hydraulic hoses and fittings.
- Evaluation of failure in pressure vessels (in particular composite wrapped aluminum liner cylinders (for breathing air and CNG tanks), as well as storage tanks in petrochemical and for water supply
- Experience with failure analysis of medical devices such as fracture analysis of catheters, components from Ophthalmic Viscosurgical Devices (OVDs) from E retaining rings to corrosion of handsets, Components from footplate assembly to fractured hip housing and upper DDL.
- Examination and failure analysis of hydraulic valves and switches , solenoid valves and diaphragms
- Examination and failure analysis of hydraulic valves and switches
- Fracture and failure analysis of engineering plastics including SEM fractography with special expertise in PVC, CPVC, POM (acetal), degradation of engineering plastics and elastomers such as o-rings and seals
- Examination and evaluation of coatings: metallic plating (adhesion and defects problem solving), polymeric coatings and evaluation of paint defects
- Electronic metallurgy and materials, extensive analysis on solder joints such as BGA's, gull wing

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and J-leads, plating and surface finishing issues, wire bond issues, metallurgical failure investigation of the microcircuit package lids, glass-to-metal seals, metal-to-ceramic-brazed joints and metallization issues, micro-switches, various electronic hardware such as ceramic chip capacitors

- Utilization of laboratory instruments in failure analysis and data analysis of Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Spectroscopy (EDS), Metallographic Examination of Metals and Alloys, and Interpretation of Microstructure, Auger Electron Spectroscopy (AES), Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

PUBLICATIONS

- ASM International Life Member. Education Chairman, Los Angeles Chapter, 1989-1991
- Society of Plastic Engineers (SPE)
- American Water Works Association (AWWA)