



FERNANDO LORENZO, Ph.D., P.E.

PRINCIPAL

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Dr. Lorenzo holds a Mechanical Engineering degree, Master of Science degree in Mechanical Engineering (manufacturing processes), and a Ph.D. in Materials Science and Engineering (metallurgy). He specializes in failure analysis of metals, plastics, corrosion mechanisms from various sources including; consumer products, automotive products, marine products, cranes and heavy equipment, piping systems, industrial equipment, steam and gas turbines, power plants, chemical plants, refineries and the oil field; electron microscopy, fractography, pressure vessels, welding, servo hydraulics, mechanical properties of metals, fatigue, creep, stress analysis, natural gas migration in soils and finite element analysis.

Prior to joining ESI, Dr. Lorenzo was the Director of Metallurgical Services for CH&A Corporation in Kingwood, Texas. He has over 35 years of experience in his work area specialties.

Areas of Specialization

Failure analysis of materials, equipment and machinery
Metal fatigue
Mechanical properties of metals
Welding, metal forming
Stress analysis
Boilers, steam and gas turbines
Pressure vessels and tanks
Natural gas migration

Education

Ph.D., Materials Science and Engineering, University of Pennsylvania, 1983
M.S., Mechanical Engineering, University of Michigan, 1978
Mechanical Engineer, Simon Bolivar University, Venezuela, 1976

Scholarships from the Simon Bolivar University for obtaining of his Master's degree
Research Fellowship from the University of Pennsylvania for obtaining of his Ph.D.
Research Fellowship from the Department of Energy of the USA for obtaining of his Ph.D.
Postdoctoral Fellowship from the University of Pennsylvania

Licensed Professional Engineer (P.E.)

State of Texas License No. 84890

August 2017

Professional Affiliations/Honors

American Society of Mechanical Engineers (ASME)

Member

American Society for Metals (ASM)

Member

Positions Held

Engineering Systems Inc., Houston, TX

Principal Engineer, 2015 to present

Director of Process and Machinery, 2014 to 2015

Manager of Houston Operations, 2005 to 2014

Senior Managing Consultant, 2005 to 2015

Senior Consultant, 1998 to 2005

CH&A Corporation, Kingwood, TX

Director, Metallurgical Services, 1997 to 1998

Crawford-THG, Houston, TX

Loss Adjuster/Head of Engineering Support Unit, 1997

Thomas Howell Group, Technical & Specialist Services, Houston, TX

Regional Director, 1993 to 1996

Cunningham IAP Americas, Caracas, Venezuela

Loss Adjuster/Head of Failure Analysis Investigations & Engineering Support Unit, 1989 to 1993

Analytica y Asociados, S.A., Caracas, Venezuela

Mechanical/Metallurgical Engineer/Head of Failure Analysis Section, 1988 to 1989

Simon Bolivar University, Caracas, Venezuela

Associate Professor of Mechanical Engineering Department, 1986 to 1989

Asesoria Tech, C.A., Caracas, Venezuela

Part-time NDT (Non-Destructive Testing) Instructor, 1988

INTEVEP (Center for Research and Development, affiliated to Petroleos de Venezuela PDVSA),

Los Teques, Venezuela

Research Engineer, Chief of Mechanical Testing Laboratories, 1983 to 1985

Simon Bolivar University, Caracas, Venezuela

Part-Time Professor of Mechanical Engineering, 1983 to 1985

Simon Bolivar University, Caracas, Venezuela

Assistant Professor and Supervisor of the Welding Laboratories, 1978 to 1979

Simon Bolivar University, Caracas, Venezuela

Instructor & Supervisor of the Mechanical Testing Laboratory, 1976 to 1977

Languages

English: Fluent
Spanish: Fluent
Italian, Portuguese: Speak, Read

Publications

- Design and production of 6 videos for the course, "Manufacturing Processes Laboratory," Simon Bolivar University, 1979
- "Strain Bursts in Pure Copper Subjected to Various Forms of Static and Cyclic Loading of Ambient Temperature," *Materials Science and Engineering* 52, 187-194, **F. Lorenzo** and C. Laird, 1982
- "Design Against Variable Amplitude Fatigue: An Approach Through Cyclic Stress-Strain Response," 6th International Conference on the Strength of Metals and Alloys, Melbourne Australia (Invited Paper), C. Laird, **F. Lorenzo**, and A.S. Cheng, 1982
- "Strain Bursts in the Cyclic Creep of Copper Single Crystals at Ambient Temperature," *Acta Metallurgica*, 32, 5, **F. Lorenzo** and C. Laird, 1984
- "Cyclic Creep Acceleration and Retardation in Polycrystalline Copper Tested at Ambient Temperature," *Acta Metallurgica*, 32, 5, **F. Lorenzo** and C. Laird, 1984
- "A New Approach to Predicting Fatigue Life Under the Action of Mean Stresses," *Materials Science and Engineering*, 62, 205-210, **F. Lorenzo** and C. Laird, 1984
- "Estudio Experimental de Fluencia Lenta (Creep) en Cobre a Temperatura Ambiente," *Revista Técnica INTEVEP*, **F. Lorenzo**, 1984, G. Gonzalez, A. Guerrero, and **F. Lorenzo**, 1989
- "Determinación de la Curva Esfuerzo Deformación a Partir de Mediciones de Dureza." Paper presented at the VIII Mechanical Engineering Congress in Barcelona, Spain, December 1989 and published in the *Anales de Ingeniería Mecánica*, Año 7, Vol. 1, pp.217-220
- "On the Origin of High Temperature Relaxation Processes in Rare-Earth Doped BaF₂ Crystals and Its Relation to Dislocations," *Solid State Ionics*, 38 (1990) 63-73, N. Suarez, E. Laredo, **F. Lorenzo**, A. Bello and M. Puma, 1990
- "Modeling of Gas Leaks in Soils: A Modern, Systematic Approach", *Journal of Porous Media*, Vol. 18, Issue 8, pp. 763-775, **F. Lorenzo** and F. Godoy, 2015

Presentations

“Modeling of Gas Leaks in Soils” presented at the Natural Gas Claims and Litigation Association, Savannah, GA., March 2005

“Dynamic Analysis of a Jack-Up Rig, SDOF Approach Design Consideration-I” presented at the ASME 2013 International Mechanical Engineering Congress and Exposition, San Diego, CA, November 2013