



HERRERA, STAFFORD & ASSOCIATES

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Shalayna Smith, Ph.D., P.E.

Texas Licensed Professional Engineer: #107478

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Principal Engineer

Herrera, Stafford and Associates, El Paso, TX

06/2012 to Present

- Conduct failure analysis investigation for clients in various industries and for litigation support.
- Supervise and train engineers in failure analysis techniques.
- Perform metallographic analyses, mechanical testing, chemistry analyses, fractographic evaluations, SEM/EDS examinations and data analyses.

Senior Metallurgical Engineer

El Paso Corporation, El Paso, TX

6/2008 to 5/2012

- Conducted failure analysis investigations of machinery and piping involved with the transportation of natural gas. Investigations included corrosion analyses of piping and machinery, stress corrosion cracking (SCC) evaluations, hydrostatic test failures, in-service leaks and ruptures of pipe, in-service failures of compressor engine components and evaluation of inspection defects.
- Provided on-site support and emergency response for major pipeline and compressor station failures. This included extensive fieldwork and coordination with pipeline operators as well as performing fitness-for-service evaluations, field photography, collection of failed components, field hardness measurements and in-place metallography and replication.
- Assisted weld and machine shops with weld procedure qualifications and material selection issues.
- Project manager for testing performed on new pipeline materials.
- Interacted with regulatory agencies (DOT-PHMSA and state regulators) during field response and laboratory analyses.
- Performed chemical analyses (OES, XRF, EDS), mechanical testing, metallographic evaluation, fractographic analysis (SEM and stereoscope) and fracture mechanics analyses.
- Performed metallurgical life assessments of turbine components (rotors and blades).
- Communicated technical analyses and taught companywide training courses on metallurgy.

Associate Engineer

Herrera, Stafford and Associates, El Paso, TX

01/2007 to 6/2008

- Worked on a cooperative team with senior engineers conducting failure analysis projects.

Research and Teaching Assistant

The University of Texas at El Paso, El Paso, TX

08/2000 to 12/2007

- Received NSF Louis Stokes Alliance for Minority Participation: Bridge to the Doctorate Fellowship.
- Trained in basic metallographic techniques, hardness testing, tensile testing, scanning electron microscopy, transmissions electron microscopy, atomic force microscopy and x-ray diffraction techniques.
- Performed quantum dynamic computer simulations of single and double-walled carbon nanotubes.
- Taught university courses for undergraduate and graduate students in electrical and metallurgical engineering.
- Conducted material characterization and close-space sublimation (CSS) of CdTe in clean room atmosphere.

Engineer Co-op

Sikorsky Aircraft Corporation, Stratford, CT

05/2002 to 08/2002

- Provided support to lab technicians on various materials projects including failure analysis, fatigue testing and qualification of new parts.
- Worked with senior engineers to create new internal specifications for applying coatings, and expedited acquiring replacement materials and new distributors for coatings.

Education

Doctor of Philosophy - Materials Science and Engineering

12/2007

University of Texas at El Paso

- Dissertation: Ab Initio Simulations of Double-Walled Carbon Nanotube Systems
- GPA: 4.0/4.0

Masters of Science - Metallurgical and Materials Engineering

12/2005

University of Texas at El Paso

- Thesis: Computational Modeling of Energetic Trends in SWCNTs
- GPA: 4.0/4.0

Bachelors of Science - Metallurgical and Materials Engineering

05/2003

University of Texas at El Paso

- GPA: 3.88/4.0 Magna cum Laude

Professional Publications

- S. L. Lair, W. C. Herndon, L. E. Murr. Stability Comparison of Simulated Double-Walled Carbon Nanotube Structures. Carbon. 2008, 46, 2083-2095.
- S. L. Lair, W. C. Herndon, L. E. Murr. Energetic trends of single-walled carbon nanotube ab initio calculations. Journal of Materials Science. 2007, 42, 1819-1827.
- L. E. Murr, E. V. Esquivel, S. Lawrie, M. I. Lopez, S. L. Lair, K. F. Soto, S. M. Gayton, D. Bujanda, R. Kerns, P. A. Guerrero, J. A. Flores. Metallurgical and acoustical characterization of an aluminum alloy (6061) Caribbean Pan. Materials Characterization. 2005, submitted work.
- S. L. Lair, W. C. Herndon, L. E. Murr, S. A. Quinones. End cap nucleation of carbon nanotubes. Carbon. 2006, 44, 447-455.
- L. E. Murr, E. V. Esquivel, A. A. Bujanda, N. E. Martinez, K. F. Soto, A. S. Tapia, S. Lair, A.

- C. Somasekharan. Metallurgical and acoustical comparisons for a brass pan with a Caribbean steel pan standard. *Journal of Materials Science*. 2004, 39, 4139-4155.
- F. M. Randrianarivony, S. Lair, A. A. Quinones, L. E. Murr. Experimental observations and computer simulations of spherical aluminum-alloy projectiles impaction plane limestone targets. *Journal of Materials Science*. 2002, 37, 5197-5207.

Job Related Training

- Conger-Elsea Root Cause Analysis Training
- Keifner and Associates Pipeline Reliability Assessment Workshop
- ASM Principles of Failure Analysis
- ASM Practical Interpretation of Microstructures
- Promoting & Achieving Continuous Excellence - El Paso Continuous Improvement Workshop

Licenses and Certifications

- Texas Licensed Professional Engineer: License #107478

Affiliations (Current and Past)

- The Minerals, Metals and Materials Society (TMS)
- The Materials Information Society (ASM)
- American Society of Mechanical Engineers (ASME)