



HERRERA, STAFFORD & ASSOCIATES

8645 RAILROAD DR. EL PASO, TEXAS 79904

WWW.HSAENGINEERS.COM

Stephen W. Stafford, Ph.D., P.E.

Texas Licensed Professional Engineer: #45174

915-533-5043 (fax)

915-203-5063 (mobile)

915-747-6930 (W)

Stafford@hsaengineers.com

Consulting Engineering Summary

Although I have had a varied academic service record, please note that I am a college professor with extensive industrial and practical experience. I have been a steel production engineer with ARMCO (Houston) in melt shop operations. This experience was extremely beneficial to formulating manufacturing processes and product service performance. Two of my more challenging project areas dealt with the steel for the Trans-Alaskan pipeline and for the United States Navy's nuclear submarine fleet.

Since 1975, I have performed failure analysis and material characterization studies on a consulting basis for a large number of manufacturers, many of which have involved litigation and manufacturing liability claims. In 1978, Dr. Juan M. Herrera and I incorporated as **Met-Tech, Inc.** (Texas) to provide the means that we could expand our engineering consulting services. Met-Tech, Inc. now is strictly involved in steel fabrication. In 2002, Dr. Herrera and I formed a new LLC strictly dedicated to consulting engineering – **Herrera, Stafford and Associates**. We now have a well-equipped laboratory dedicated to material performance analysis in the El Paso/Juarez area and a very long list of satisfied customers.

In 1980, I devised a senior engineering course in failure analysis. I have taught this course for almost every semester since that time. This course has been so popular that the UT System has considered broadcasting the course across the State to other UT system campuses.

Also, I have worked closely with the El Paso Natural Gas, El Paso Corporation (now Kinder Morgan Inc.) as a consulting engineer. My projects have focused on a wide array of gas compression equipment, gas transportation systems, reciprocating engines and land-based turbines. In this capacity, I have grown in the areas of nondestructive evaluation, structural integrity assessment, fracture mechanics, corrosion deterioration mechanisms, weld fabrication and reverse engineering of structural components.

Education

Doctor of Philosophy - Materials Science and Engineering 1975
Rice University

Bachelors of Science - Metallurgical Engineering 1970
University of Texas at El Paso

Experience

1968	Bunker Hill Lead & Zinc	Kellogg, Idaho	Fce. Operator
1969,70-72	ARMCO Steel	Houston TX	Process Metallurgist
1972-75	Rice University	Houston, TX	Graduate Student
1975	Rice University	Houston, TX	Welch Post-Doc
1975-76	U. of Houston	Houston, TX	V. Assist Prof. ME
1976-80	UTEP	El Paso, TX	Assistant Prof. MetE
1978-2003	Met-Tech, Inc.	El Paso, TX	Co-owner, Pres. & VP
1980-88	UTEP	El Paso, TX	Associate Professor
1981-84,89-90	UTEP	El Paso, TX	Assistant Dean Engr
1984-87,89	UTEP	El Paso, TX	Chairman of MetE
1988-Present	UTEP	El Paso, TX	Professor
1990-91	UTEP	El Paso, TX	Assistant VP for Academic Affairs
1991-1993	EPNG	El Paso, TX	Consulting Engineer
1995-2001	UTEP	El Paso, TX	Associate Dean Engr.
2002-Present	HSA	El Paso, TX	Co-owner & VP
2004-2006	UTEP	El Paso, TX	MME Program Head
2006-2007	UTEP	El Paso, TX	Interim Dean
2007-Present	UTEP	El Paso, TX	Freeport-McMoRan Copper & Gold Endowed Professor

Special Awards, Honors and Other Recognitions

- ASEE and Dow Chemical Outstanding Young Engineering Faculty Award (1980)
- ASM Bradley Stoughton Award for Young Teachers of Metallurgy (1983)
- SAE Ralph R. Teetor Educational Award (1984)
- AMOCO Foundation Outstanding Teaching Award (1985)
- Outstanding Service to the University Award (1988)
- Minnie Stevens Piper Foundation Professor (2006)
- Freeport-McMoRan Copper & Gold Endowed Professor (2007)
- Burges High School Outstanding EX (2008)
- Texas Board of Regents' Outstanding Teaching Award (2011)

Professional Organizations

- American Society for Materials International (ASM)
- Tau Beta Pi National Engineering Honor Society
- Alpha Sigma Mu National Metallurgical & Materials Engineering Honor Society
- Sigma Xi
- Phi Kappa Phi
- Licensed Professional Engineer (1978-Present), State of Texas, No. 45174

Scholarly Activity (Recent)

- S. Tapia, R. Villa, C. R. Ortiz, E. Trillo, S. W. Stafford and L. E. Murr, "Cell Culture Testing of Ti40Ta and Ti50Ta Alloys for Biocompatibility Evaluation," Poster Presentation, UTEP Research Expo, April 2001.
- E. A. Trillo, C. Ramirez, P. Dickerson, R. Villa, S. W. Stafford, and L.E. Murr. "Evaluation of Mechanical and Corrosion Biocompatibility of TiTa Alloys," J. Materials Science: Materials in Medicine 12, (2001), 283-292.
- W. Davis, E. Villa and S. W. Stafford, "Discover Engineering Day – Collaborations in Pre-College Enrollment," ASEE National Conference, Albuquerque, June 2001.

- D. Casteneda, R. Gomez, C. Kubo Della-Piana, and S. W. Stafford, The Academic Center for Engineers and Scientists – Focused Resources and Activities for Studentretention, ASEE National Conference, Albuquerque, June 2001.
- J. M. Herrera and S. W. Stafford, Failure Analysis: A Performance Theme for Engineering Design, ASEE National Conference, Albuquerque, June 2001.
- C. Ortiz, R. Villa, G. Gonzalez, E. Trillo, S. W. Stafford and L. E. Murr, Thermomechanical Analysis of Ti40Ta and Ti50Ta Alloys, Proceedings of TMS Spring Conference, February 2001, New Orleans.
- R. Villa, C. Ortiz, G. Gonzalez, E. Trillo, S. W. Stafford, and L.E. Murr, Biocompatibility Studies Using Cell Culture Testing of Ti40Ta and Ti50Ta Alloys for Implant Consideration, Proceedings of TMS Spring Conference, February 2001, New Orleans.
- G. Gonzalez, C. R. Ortiz, R. Villa, S. Trillo, S. W. Stafford, and L.E. Murr, Microstructural Evaluation of Titanium-Tantalum Alloys for Biomedical Consideration, 3rd Annual Student Poster Session –TMS Spring Conference, February 2001, New Orleans.
- E. Q. Villa, L. D. Rios, S. Stafford, and G. Gandara, K-16 Partnerships: Casting a Broad Net for Filling the Critical Gaps in Engineering, Invited paper for the 31st ASEE Frontiers in Education Conference, October 2001, Reno.
- J. Fierro, D. Grajeda, R. Gomez, B. Flores, & S. W. Stafford, “The Academic Centers for Engineers and Scientists – A Team Model for Student Support at UTEP,” ASEE Conference, Session 1691, Montreal, 2002.
- W. Davis, E. Villa & S. W. Stafford, Discover Engineering Days, ASEE National Conference, Session 1691, Montreal, 2002.
- R. Villa, G. Gonzalez, A. S. Tapia, E. Trillo, S. W. Stafford and L. E. Murr, “Biocompatibility Studies of Ti40Ta and Ti50Ta using NIH-3T3 Fibroblast Cells to Assess Cytotoxicity and Proliferation Responses,” *Japan Institute of Metals Mater. Trans.*, November 2002 (by invitation of editors Y. Okazaki and M. Niinomi).
- D. M. Cone and S. W. Stafford, “Are You Prepared for Failure?” ASME Regional Conference (Las Cruces, NM), April 2003 (keynote speakers by invitation).
- D. M. Cone and S. W. Stafford, “Failure in Engineering Design,” Society of Forensic Engineers and Scientists Conference (Solvang, CA), May 2003 (keynote speakers by invitation).
- S. W. Stafford, “ Case Studies in the Failure Analysis of Turbomachinery,” Presented to Stress Engineering Systems (Houston, TX), June 2003, (by invitation).
- S. W. Stafford, “Degradation of Deep Water Well Components in Agricultural Service,” NACE-Paso Del Norte Chapter, April 2004, (by invitation).
- D. M. Cone and S. W. Stafford, “C-1601 Overhead Vapor Line - A Preliminary Failure Analysis,” NACE-Paso Del Norte Chapter, May 2004, (by invitation).
- S. W. Stafford, “Turbine Component Life Extension Strategies,” ANR Pipeline and El Paso Corporation Workshop, Dearborn, May 2005.
- S. W. Stafford, “CSI-El Paso,” A Presentation to the Math-Science Coordinators from EPISD and YISD (MSP Program Activity). May 2005.
- S. W. Stafford, “Forensic Engineering,” Presented to Paso Del Norte Chapter of NACE (El Paso, TX), March 2006.
- S. W. Stafford, Failure Analysis Case Studies in Support of Structural Integrity Assessment, Laboratory Services Symposium, Phoenix, February 2007.
- N. Camacho and S. W. Stafford, "Failure Analysis on Retrieved Ultra-High-Molecular Weight Tibial Components," International Journal of Medical Implants and Devices, Medical and Engineering Publishers, Inc., PO Box 74 Sunshine, MD 20833-0074, ISSN:1555-9254. Volume 3, Number 1, 2008, Pp. 25.
- N. Camacho and S. W. Stafford, "Failure Analysis on Retrieved Ultra-High-Molecular Weight Tibial Components," Biomedical Engineering: Recent Developments, Medical and

Engineering Publishers, Inc., PO Box 74 Sunshine, MD 20833 USA, ISBN: 978-1-930636-07-1, 2008.

- N. Camacho and S. W. Stafford, "Failure Analysis on Retrieved Ultra-High-Molecular Weight Tibial Components," Proceedings of the Twenty Fourth Southern Biomedical Engineering Conference, April 18-20, 2008, College of Engineering, The University of Texas at El Paso, El Paso, TX, USA, Pp. 195-200.
- L.E. Murr, E.V. Esquivel, S.A. Quinones, S.M. Gaytan, M.I. Lopez, E.Y. Martinez, F. Medina, D.H. Martinez, J.L. Martinez, S. W. Stafford, D.K. Brown, T. Hoppe, W. Meyers, R. B. Wicker, and U. Lindhe, "Microstructures and Mechanical Properties of Electron Beam-Rapid Manufactured Ti-6Al4V Biomedical Prototypes Compared to Wrought Ti6Al4V," Biological Materials Science Symposium, TMS-2008, March 2008, New Orleans.
- N. Camacho and S. W. Stafford, "*Failure Analysis on Retrieved Ultra-High Molecular Weight Polyethylene Tibial Components*," 24th Southern Biomedical Engineering Conference, April 2008, El Paso, 195-200.
- L.E. Murr, E.V. Esquivel, S.A. Quinones, S.M. Gaytan, M.I. Lopez, E.Y. Martinez, F. Medina, D.H. Martinez, J.L. Martinez, S. W. Stafford, D.K. Brown, T. Hoppe, W. Meyers, R. B. Wicker, and U. Lindhe, "Microstructures and Mechanical Properties of Electron Beam-Rapid Manufactured Ti-6Al4V Biomedical Prototypes Compared to Wrought Ti6Al4V," Materials Characterization 60, Elsevier, 96-105 (2009).
- N. Camacho, L. Trueba and S. W. Stafford, "*Computational Analysis on Retrieved Ultra-High Molecular Weight Polyethylene Tibial Components from Total Knee Replacements*," 25th Southern Biomedical Engineering Conference, May 2009, Miami, FL.
- Bastidos, K. Ortiz and S. W. Stafford, "Failure Analysis and Materials Characterization of Hip Implants," (Poster Session), 3rd Annual Colloquium-Texas Tech University Health Sciences Center and Paul L. Foster School of Medicine, July 2009.
- N. Camacho, L. Trueba and S. W. Stafford, "*Progressive Wear Damage Analysis on Retrieved UHMWPE Tibial Implants*," 26th Southern Biomedical Engineering Conference, May 2010, Baltimore, MD.
- Bastidos and S. W. Stafford, "Failure Analysis and Microstructural Characterization of Hip Implants." 26th Southern Biomedical Engineering Conference, May 2010, Baltimore, MD.
- S. Gaytan, B. Machado, E. Martinez, F. Medina, L. Murr and D. Ramirez, Reticulated Mesh Arrays and Dissimilar Array Monoliths by Additive Layered Manufacturing Using Electron and Laser Beam Melting (provisional patent filed 2010).
- J. C. Contreras, S. L. Natividad & S. W. Stafford, "Failure Analysis Case Study on a Fractured Tailwheel Fork," J. Fail. Anal. And Prev. 11, 2011, 372-378.
- L. Trueba and S. W. Stafford, Materials Performance and Degradation: An Introduction to Materials Selection and Design, Kendall-Hunt Publishing, In-Press. (Completion date September 2013).