



KIMBERLY K. CAMERON, Ph.D., P.E.

PRINCIPAL

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Dr. Kimberly Cameron is a Principal for ESi in the Mechanics and Materials practice. She specializes in design, failure analysis, and risk assessments of engineering structures and components. She has conducted hundreds of investigations on a wide variety of engineering structures, from miniature biomedical devices to large scale process equipment. She has also taught classes for engineers preparing to take the fundamentals of engineering exam and the professional engineering licensing examination in both Civil Engineering and Mechanical Engineering.

Dr. Cameron has performed design and damage tolerance evaluations on biomedical devices, pipelines, aircraft structures, industrial machinery, power-plant components, solar panels, pressure vessels, and vehicle components. Dr. Cameron also has extensive experience evaluating pipe-soil interactions, mechanical and welded joints, in-line inspection tools, regulatory compliance, and the overall integrity of pipeline systems. The common thread in each of Dr. Cameron’s investigations is the application of the fundamentals of metallurgy, materials science, engineering physics, computational mathematics, and engineering mechanics to help understand and solve complex problems.

Dr. Cameron is a registered patent agent, with experience in both the patent application process, as well as intellectual property disputes. In particular, she has experience in biomedical, automotive, electrical, mechanical, and materials science fields and has provided numerous invalidity and infringement reports.

Areas of Specialization

Metallurgy	Stress Analysis	Pipelines
Plastics	Failure Analysis	Consumer Products
Corrosion	Fatigue Analysis	Biomedical Devices
Materials Selection	Fracture Mechanics	Electronic Devices
Mechanical Engineering	Product Design	Intellectual Property Matters
Engineering Mechanics	Reliability	

Education

Ph.D., Mechanical Engineering, minor Materials Science & Engineering, Stanford University, CA, 2004

M.S., Mechanical Engineering, Stanford University, CA, 2000

B.S.E., Mechanical Engineering. Certificates: Engineering Physics, Applied & Computational Mathematics, Materials Science & Engineering, Woodrow Wilson School of Public Policy & International Affairs, Princeton University, NJ, 1999

January 2019

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Licensed Professional Engineer (P.E.)

Mechanical Engineer, State of California License No. 33732
Metallurgical Engineer, State of California.....License No. 1969

Professional Affiliations/Honors

American Society of Mechanical Engineers

Member

TMS

Member

Department of Defense

Fellowship

National Science Foundation

Fellowship

Lucent Technologies

Graduate Fellowship

Positions Held

Engineering Systems Inc., Sunnyvale, California

Senior Managing Consultant, Mechanics & Metallurgy, 2011 – Present

Exponent, Menlo Park, California

Senior Engineer, Mechanics & Metallurgy, 2004 – 2011

Publications/Presentations

“Crack Growth and Arrest in Steam Turbine Casings,” EPRI 3002003504, EPRI, Palo Alto, CA, December 2014.

M. H. Anderson, D. Cislo, J. Saavedra, and **K. Cameron**, Why International Inventors Might Want to Consider Filing Their First Patent Application at the United States Patent Office & the Convergence of Patent Harmonization and E-Commerce, 30 Santa Clara High Tech. L.J. 555 (2014).

“Increasing Reliability of Small Punch Fracture Toughness Testing with Acoustic Emission Monitoring,” Proceedings, 3rd International Conference on Small Sample Test Techniques, September 2014. (with D. Purdy and J. Foulds).

“Small Punch Fracture Toughness Evaluation of Combustion Turbine Materials,” EPRI 3002001468, EPRI, Palo Alto, CA, December 2013. (with D. Purdy, J. Foulds and J. Rodgers).

- “Small Punch Testing for Fracture Toughness” by J. Foulds, J. Rodgers, **K. Cameron** and P. Sullivan, EPRI, Palo Alto, CA: 2013. 3002000250.
- “The Effect of Low Sulfur Content on the Weldability of Linepipe Steel” by **K. Cameron** and A.M. Pettinger, Proceedings of the 9th International Pipeline Conference, September 2012.
- “Effectiveness of Hydrostatic Testing for High Strength Pipe Material” by **K.K. Cameron** & A.M. Pettinger, Proceedings, 8th International Pipeline Conference, October 2010.
- “Axial Loads from Soil Movement Challenge Pipeline Integrity” by **K.K. Cameron** & A.M. Pettinger, PipeLine Gas Technology, November 2009.
- “Assessing Pipeline Integrity Using Fracture Mechanics and Currently Available Inspections Tools” by **K.K. Cameron** & A.M. Pettinger, Journal of Pipeline Engineering, October 2009.
- “Assessing Pipeline Integrity Using Fracture Mechanics and Currently Available Inspections Tools” by **K.K. Cameron** & A.M. Pettinger, Proceedings, 2008 Evaluation and Rehabilitation of Pipelines Conference, Clarion Technical Conferences, Scientific Surveys Ltd., Prague, Czech Republic, October 2008.
- “Fatigue Damage in Bulk Metallic Glass I: Simulation” by **K.K. Cameron** & R. Dauskardt, Scripta Materialia 2006; 54(3):349–353.
- “Fundamentals of Engineering in a Flash” by **K.K. Cameron**, PPI, August 2006.
- “Transmission Electron Microscopy Structure and Platinum-like Temperature Coefficient of Resistance in a Ruthenate-Based Thick Film Resistor with Copper Oxide” by **K.K. Cameron**, G. Crosbie, J. Jiang, & X. Pan, J. Appl. Phys. 2000; 88:1124–1128.

Selected Project Experience

Evaluated the design, pipeline integrity management program, in-line inspection tools, and operation and maintenance practices of both liquid and gas pipeline systems under both 49 CFR 195 and 192.

Failure analysis, design, material selection, mechanical testing, finite element analysis, fatigue and fracture evaluation, and development of various medical devices including cardiovascular implants, orthopedic implants, heart valves, stents, catheters, pacemakers, surgical tools, needles, manifolds, syringes, scooters, physical therapy equipment, drug delivery devices, etc. Performed analyses to support FDA submissions.

Performed prior art searches, infringement and validity analyses on products in many industries, including washing machines, fishing reels, wind turbines, ultrasonic flow meters, cribs, beds, electronic devices, electrical connectors, consumer products and electronics, automotive components, seals, pipe fittings and components, utility knives, nitrile gloves, insulin pens, slicers, medical devices, drug delivery devices, and lasers for engraving.

Retained as an expert for the United States Patent and Trademark Office in the evaluation of a patent claim dispute relating to large diameter pipes.



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Assisted the Inter-American Development Bank (IDB) with a pipeline integrity study. The investigation integrated geotechnical site investigations, metallurgical investigations, in-line inspection (ILI) data, external pipe inspection data, and fracture mechanics to perform a root cause failure analysis.

Evaluated the welding procedures and determined the effect of welding defects and other construction factors on pipeline integrity. Investigated pipe soil interactions occurring during hydrostatic testing of pipelines and the evaluation of pipeline ruptures and leaks at welded joints.

Assisted with the investigation of the operation and maintenance procedures of a natural gas pipeline that is located in close proximity to a coal mine.

Assisted the Inter-American Development Bank (IADB) with the supervision of the implementation of a pipeline integrity management program for a pipeline operator.

Performed a failure analysis of an insulated steel pipe. The investigations determined that the polyurethane foam of the buried hot water distribution system suffered excessive creep deformation.

Design evaluation and failure analyses of pipe couplings and fittings, including finite element analyses.

Assisted the general contractor of a nuclear power plant where a large pipe of the primary circuit was vibrating excessively, significantly reducing the allowable power production.

Evaluated the design of a hydrogenerator system. Performed a finite element analysis and fatigue analysis of the rotors, thrust bridge, and head cover to assess the design.

Developed a three-dimensional model of the control rod drive mechanism nozzle penetration in a nuclear reactor pressure vessel head. Evaluated welding-induced residual and operational stresses.

Performed numerical simulation and small punch testing to evaluate fracture toughness and tensile behavior of miniature surface samples from a steam turbine rotor bore and from medical device plastics.

Performed fitness for service and design evaluations for welds in various applications, including in fuel storage tanks, process reactor vessels, scaffoldings, semitrailers, and other automotive components.

Performed design and failure analyses of various gas distribution systems made of polyethylene and steel pipe, including the analysis of pipe-soil interactions, failure analysis of various components, evaluation of welding and construction practices, and performance evaluation of compression couplings.

Performed failure analysis and finite element analyses of various water distribution systems including various fire sprinkler systems, water supply systems and couplings, and a ten foot wide water main. Evaluated the design of various rotors, bearings and seals. Assisted in the design of various drug delivery devices.



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Evaluated the material selection and performance of various medical devices.

Developed testing protocols, and conducted failure analyses and design reviews for various consumer electronic devices, electromagnetic latches, power cords, and jacket sleeves.

Evaluated the material selection and performance for various components of several consumer electronic devices such as phones, tablets and computers.

Investigated the manufacturing procedures of an electromagnetic latch used in aerospace applications.

Performed stress analysis of various solar panel components and assisted in design changes to meet standardized safety testing. Evaluated the design of a diode on a solar panel for space applications.

Design evaluation and stress analysis of various consumer products, including washing machines, refrigerators, baby chairs, microwave ovens, coffee machines, exercise machines, etc.

Assisted in the design of a syringe used to remove fluid from a wound. Performed structural evaluations of various scaffoldings and other structures.

Performed welding and structural evaluation of various automotive components including semitrailers. Performed a failure analysis and evaluation of integrity management procedures for a system constructed from pre 1970s ERW linepipe steel.

Evaluated pipeline construction practices and performed a failure investigation after a landslide event. Performed a stress analysis to evaluate the effects of tightening torques on a ton container valve.