

Kimberly K. Cameron

PhD, PE
Principal



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 multidisciplinary investigations on biomedical devices, pipelines, consumer electronics, consumer products, aircraft structures, industrial machinery, construction equipment, heat exchangers and cooling fins, refrigeration products, power-plant components, solar panels, pressure vessels, and vehicle components. 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. She has testified in federal and state court as well as in front of the ITC and in arbitration.

Education

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

MS, Mechanical Engineering, Stanford University, CA, 2000.

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

Contact Information

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ESi California

Areas of Specialization

- Intellectual Property Matters
- Mechanical Engineering
- Structural Engineering
- Root Cause Investigations
- Regulatory Compliance
- Failure Analysis
- Biomedical Devices
- Oil & Gas
- Energy & Power
- Electrical Equipment
- Automotive & Aviation
- Metallurgy
- Plastics & Composites
- Corrosion
- Materials Selection
- Product Design
- Product Recalls
- Consumer Products & Electronics

Licenses & Certifications

- Mechanical Engineer, State of CA PE License #33732
- Metallurgical Engineer, State of CA PE License #1969

Positions Held

Engineering Systems Inc., California

- Principal, Mechanics, 2011 – Present

Exponent, Menlo Park, California

- Senior Engineer, Mechanics & Metallurgy, 2004 – 2011

Professional Affiliations/Honors

American Society of Mechanical Engineers

- Member

TMS

- Member

Department of Defense

- Fellowship

National Science Foundation

- Fellowship

Lucent Technologies

- Graduate Fellowship

Project Experience

Selected Project Experience

- Failure analysis, design analysis, material selection, mechanical testing, finite element analysis, fatigue and fracture evaluation, and development of various implantable medical devices including cardiovascular implants (heart valves, stents, catheters, pacemakers), orthopedic implants (screws, plates, pins, hip implants, spinal implants), cranial implants, etc.
- Design and failure analysis of various fluid and drug delivery systems including implantable pumps, drug eluting stents, syringes, patches, microneedles, CPAP machines, anesthesia machines, insulin and other drug delivery pumps, balloon respirators, etc.

- Design and failure analysis of other types of medical devices including surgical tools, scooters, hospital beds, physical therapy equipment, refrigerated portable coolers, etc.
- Performed analyses to support FDA submissions
- Evaluated the design, pipeline integrity management program, in-line inspection tools, leak detection systems, control room management and operation and maintenance practices, of both liquid and gas pipeline systems under both 49 CFR 195 and 192.
- Evaluated pipeline construction practices of various pipeline systems and performed pipeline failure investigations after various landslide events.
- Assisted the Inter-American Development Bank with a pipeline integrity study and supervision of implementing a pipeline integrity management program. This included geotechnical site investigations, fracture mechanics, metallurgical investigations, in-line inspection data, and external inspection data.
- Evaluated welding procedures and determined the effect of welding defects and other construction factors on pipeline integrity.
- Evaluated pipe-soil interactions, mechanical and welded joints, welding procedures, in-line inspection tools, regulatory compliance, and the overall integrity of pipeline systems.
- Failure analysis of various insulated steel oil and water pipeline systems, including behavior of the polyurethane foam and jacket materials.
- Design evaluation and failure analyses of pipe couplings and fittings, including finite element analyses, as well as analysis of various plumbing fixtures and components.
- Performed design and failure analyses of various gas distribution systems made of polyethylene and steel pipe, including the evaluation of compression couplings.
- 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.
- Evaluated the design of a hydro generator system. Performed a finite element analysis and fatigue analysis of the rotors, thrust bridge, and head cover to assess the design.
- Evaluated the design of various pumps, rotors, bearings, seals and insulation systems.
- Thermal analyses of industrial heat exchangers and cooling fins, nuclear reactor heads, and welds.
- Failure analysis of various refrigeration systems and components and HVAC system components.
- Performed design analysis of various solar panel system components and assisted in design changes to meet standardized safety testing.
- Developed testing protocols and conducted failure analyses and design reviews for various consumer electronic devices and accessories, electrical connectors, power cords, and jacket sleeves.
- Design of electrical connectors and various components of several consumer electronic devices including phones, tablets, and computers.

- Design evaluation of various consumer products, including washing machines, refrigerators, various child containment products, hand and power tools, security and display systems, coffee machines, exercise machines, cooling sleeves and pads, consumer electronic accessories, breast pumps, baby bottles, etc.

Publications

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

“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,” M. H. Anderson, D. Cislo, J. Saavedra, and **K. K. Cameron**, Santa Clara High Technology Law Journal, Vol. 30, Issue 4, 2013.

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

“Small Punch Testing for Fracture Toughness,” J. Foulds, J. Rodgers, **K.K. Cameron**, and P. Sullivan, EPRI, Palo Alto, CA: 3002000250, 2013.

“Axial Loads from Soil Movement Challenge Pipeline Integrity,” **K.K. Cameron** & A.M. Pettinger, PipeLine Gas Technology, November 2009.

“Assessing Pipeline Integrity Using Fracture Mechanics and Currently Available Inspections Tools,” **K.K. Cameron** & A.M. Pettinger, Journal of Pipeline Engineering, October 2009.

“Fatigue Damage in Bulk Metallic Glass I: Simulation,” **K.K. Cameron** & R. Dauskardt, Scripta Materialia 2006; 54(3):349–353.

“Fundamentals of Engineering in a Flash,” **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,” **K.K. Cameron**, G. Crosbie, J. Jiang, & X. Pan, J. Appl. Phys. 2000; 88:1124–1128.

Presentations

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

“The Effect of Low Sulfur Content on the Weldability of Linepipe Steel,” **K.K. Cameron** and A.M. Pettinger, Proceedings of the 9th International Pipeline Conference, Calgary, Alberta, Canada, September 2012.

“Effectiveness of Hydrostatic Testing for High Strength Pipe Material,” **K.K. Cameron** & A.M. Pettinger, Proceedings, 8th International Pipeline Conference, Calgary, Alberta, Canada, October 2010.

“Assessing Pipeline Integrity Using Fracture Mechanics and Currently Available Inspections Tools,” **K.K. Cameron** and A.M. Pettinger, Proceedings, 2008 Evaluation and Rehabilitation of Pipelines Conference, Clarion Technical Conferences, Scientific Surveys Ltd., Prague, Czech Republic, October 2008.