



GLEN STEVICK, Ph.D., P.E.
Mechanical Engineer, Principal

SUMMARY

Dr. Stevick has over 35 years of experience in failure analysis, design, damage mechanics (corrosion, fracture, fatigue, creep, etc.) and risk assessment of: structures; stadium roofs; industrial equipment; medical devices such as aortic stents, hip and knee implants and spinal rod implants; exercise equipment; turbines and reciprocating engines; automotive and aircraft components; offshore platforms for wind generation and oil exploration; pressure vessels and piping systems; blowdown, blowout and breakaway systems; heat exchangers, boilers and furnaces; and electronic controls and interlocks for battery systems, consumer products and industrial equipment. Engineering design projects have involved testing and mathematical analysis of electronic control and hydraulic control systems; fire causation, spread and mitigation; explosion causation and prevention systems; structural dynamics and mitigation devices; material behavior improvement; heat transfer and structure/fluid interaction; and the development of medical cauterizing forceps, powerline detection systems, MRI and 3D scanning for pipe and pressure vessel corrosion detection and analysis, PWM motor controllers, 3D scanners and a new product development group working on a variety of consumer and medical products.

SELECT INDUSTRY EXPERIENCE

Milwaukee Stadium roof failure analysis and redesign. Deepwater Horizon Investigation. San Bruno pipeline fracture investigation for the Office of the Governor and the CPUC. Stress and fracture analysis of Bigge's D125 15 million pound capacity crane. Submarine drive system analysis for the US Navy. Consultant to the Golden Gate Bridge District for several retrofit projects. Fracture analysis of the first tension leg platforms for Chevron Corp. Blowout and Breakaway Devices for Chevron and Tesoro. Fracture control plans for Conoco's refinery structures. Alaska Pipeline fracture control plans for the pipeline operator Alyeska and the Bureau of Land Management. Over 200 cases of lithium ion battery fire/explosion cases.

EDUCATION

Ph.D. Mechanical Engineering, University of California, Berkeley
M.S. Mechanical Engineering, University of California, Berkeley
B.S. Mechanical Engineering, Michigan Technological University

PROFESSIONAL AFFILIATIONS

Registered Mechanical Engineer, State of California, Nevada, Texas, Louisiana
American Society of Mechanical Engineers
Society of Forensic Engineer and Scientists
Member of ASTM Committees: E05, E08, F15.1, and F15.10

PROFESSIONAL EXPERIENCE

1986 – present

Principal, Consultant, Berkeley Engineering And Research, Inc.

Provide consultation in the areas of failure analysis, design, fracture mechanics and risk assessment, including analysis of codes and standards, medical devices and industrial equipment. Failure analysis work has varied from assessing the failure of cranes, medical implants, bone fractures, ladders, chairs, industrial presses, aircraft engines, boiler and turbine generator failures, and propane/natural gas equipment and electronics to the analysis of defective safety devices on compressor/heat exchanger systems and fire investigation. Design projects have included the redesign of an electrohydraulic, variable position hospital bed for burn victims; medical implants (spine rod, heart valve, aorta insert, pacemaker, hip, knee and fatigue design); the design of a powered wheelchair that provides standing and sitting positions; the analysis, redesign and rerating of high temperature/high pressure boiler, pressure vessel and piping systems; the design of fire safe storage vaults for electronic media; dynamic damping devices for tall structures and bridges subject to wind and earthquake loading; the redesign of pistons and valves for high pressure hydrogen compressors; and electronic sensors for structural health monitoring.

Fire investigation, electrical, and combustion analysis cases have included the evaluation of over 200 home fires; dozens of propane and natural gas fired equipment fires, including barbecues, heaters, furnaces and cooking appliances; refinery, chemical plant, power plant and coal processing plant fires and explosions; and the evaluation of fuel containers, including propane tanks, charcoal lighter fluid cans, and gasoline containers from 1 gallon consumer containers to tanks containing thousands of gallons. More than 200 gasoline fire and explosion tests have been conducted at BEAR as well as hundreds of lithium ion battery, magnetic field, electric field and spark tests. Design projects have included the design and evaluation of hydrocarbon handling equipment (towers, tanks, pumps, compressors, piping, valves, heat exchangers and furnaces), burner and flow modeling, leak detection methods for tanks, flame arrestors for storage, relief and vapor recovery systems, and burn/spark/fire resistant cauterizing forceps for surgery.

8/90 - 1/91

Mechanical Engineering Instructor, University of California, Berkeley

Instructor for the Department's senior design course: ME-102B, "Mechanical Engineering Design." Conducted lectures on the design of bolted joints, springs, gears, bearings, chain drives, wire ropes, and other mechanical components. Guided students through a major design project.

3/82 - 1/89

Engineering Mechanics Specialist, Chevron Corporation

Handled highly technical projects and provided technical consultation to field engineers in the areas of failure analysis and design. Projects included the redesign of compressor and turbine components, and the design of processing equipment for service temperatures above 1400 degrees Fahrenheit. Consultation varied from giving design advice on how to avoid structural vibration to calculating crack growth rates for offshore platforms in the North Sea.

9/81-3/82

Project Engineer, Chevron USA Production

Responsibilities included the design, and construction management of oil/water separation plants and gas recovery plants in the Bakersfield and Colinga oil fields.

PATENTS

“Thermo-electric Container” for heating and cooling liquids, G.R. Stevick and H. Sherback, US6119461, September 19, 2000.

“Method and Apparatus for Detecting and Monitoring Oil Spills and Leaks,” by Jerome Singer, and Glen Stevick, US9279738 B1, March 8, 2016.

“Method and Apparatus for Magnetic Response Imaging,” J. Singer, and D. Rondinone, G.R. Stevick, J. Zalabak, US8395376 B2, May 24, 2012.

"Method and Apparatus for Dynamic Space-time Imaging System" G.R. Stevick, D. Rondinone, J. Singer, A. Sagle, US7961912 B2, June 14, 2011 (continuation of US7620209).

"Method and Apparatus for Dynamic Space-time Imaging System" for creating a 3D map of the surface contours, J. Singer, G.R. Stevick, D. Rondinone, M.D. Rocklin, US7620209 B2, Nov 17, 2009.

PUBLICATIONS, SELECTED REPORTS AND PRESENTATIONS

Yuan, R. and G.R. Stevick, “Lithium Ion Batteries and E-Cigarette Fires and Explosions,” Society of Forensic Engineers and Scientists (SFES) Conference Seminar, Healdsburg, CA. 4-6-2019.

Nemire, K., Stevick, G., and D. Xu, “Forensic Evaluation of a Hazardous Household Product.” *Ergonomics in Design*, 25(2) (2017) 15-24.

Stevick, G.R., Mosaic Fertilizer, LLC, Uncle Sam Louisiana, “Steam Turbine Generator Incident,” January 31, 2017.

Stevick, G.R., “Electrical Fires – Fires and Accidents,” Presentation to State Farm Investigators and NASP, September 25, 2015.

Stevick, G.R., Rondinone, D., and A. Sagle, “Flame Arrestors for Gelled Alcohol Containers,” Society of Forensic Engineers and Scientists (SFES) Conference Seminar, Yosemite Valley, CA. 4-6-2014.

Singer, J.R., Stevick, G.S., Rondinone, D. and R. Rice, “Pipeline Monitoring, Economics, and the MRI System,” *Materials performance* 54(2):52-54 · February 2015.

Stevick, G.R., “Deepwater Horizon Update - Drill Pipe Buckling and Shearing,” SFES Maritime Seminar, Emeryville, CA, May 27-29, 2016.

- Andres, D., and G.R. Stevick “Overhead Powerline Early Warning Devices for Cranes, Lifts and other Aerial Mobile Equipment,” Berkeley Engineering And Research, Inc., 2012.
- Stevick, G.R., Zicherman J., Rondinone D., Sagle A. "Failure Analysis and Prevention of Fires and Explosions with Plastic Gasoline Containers." *Journal of Failure Analysis and Prevention* 11.5 (2011): 455-65.
- Stevick, G.R., Rondinone D., Sagle A., Zicherman J. “Fire Incidents and Explosions Involving Portable Plastic Gasoline Containers And Their Prevention.” *Journal of Failure Analysis and Prevention* (2011).
- Stevick, G.R., Rondinone D., Sagle A., Zicherman J. “Portable Gasoline Container Explosions and Their Prevention.” *Society of Forensic Eng’s and Scientists Winter Seminar*, 19-21 March 2010.
- Rondinone, D., Sagle A., Stevick, G.R. “API Aboveground Tank Leak Detection Liquid Level Measurement Technique Evaluation,” for The American Petroleum Institute, 09 Nov. 2009.
- Rondinone, D., Stevick, G.R. “Olympic Spirit Vapor Recovery System Fire Investigation and System Review,” for Tesoro Corporation, by Berkeley Engineering And Research, Inc., 18 May 2009.
- Stevick, G.R. “Marine Crude Oil Transfer Breakaway, Hawaii Single Point Mooring Terminal,” for Tesoro Corporation, by Berkeley Engineering And Research, Inc., 19 May 2008.
- Stevick, G.R., Hart, J., Lee, C., Dauby, F. “Fracture Analysis for Pipeline Girth Welds in High Strain Applications.” *Pipeline and Gas Technology*, Jan. 2006.
- Stevick, G.R., et al. “Golden Gate Bridge, Phase II Seismic Retrofit, Transverse Energy Dissipation Devices,” for The Golden Gate Bridge District, by Berkeley Engineering And Research, Inc., 01 July 2005. (*Project won the American Society of Civil Engineers 2007 Opal Award for the Most Outstanding Civil Engineering Achievement.*)
- Berkeley Engineering And Research, Inc. “Rolling Mill Structure and Mandrel Finite Element Analysis,” for USS-POSCO Industries, 20 Aug. 2002.
- Berkeley Engineering And Research, Inc. “Effect of the Windshield on Roof Strength and Displacement,” for James Collins and Associates, 6 Oct. 2000.
- Warner, P., Stevick G.R., Thomas, E. “Main Propulsion Unit, Aft Second Reduction Gear Bearing Failure Assessment,” for Northrup Grumman and the US Navy, 9 April 1999.
- Maple, J.A. and Associates, SSD Engineering Consultants, Glen Stevick and Berkeley Engineering And Research, Inc. “Study of Effects of Vibrations Due to Pressure Pulses on the Integrity of the Trans-Alaska Pipeline,” for Alyeska Pipeline Service Company, 26 Jan. 1997.
- Berkeley Engineering And Research, Inc. “Computation of the Stresses in a Shaft Due to Torsion,” for EC Engine Components, Inc., 19 Aug. 1996.

- Berkeley Engineering And Research, Inc. "Excel Spreadsheet-Based Fitness For Service Model Providing Inspection Interval and Remaining Life of Coke Drums," *for* Chevron Research & Technology Company, 12 Jan. 1996.
- Berkeley Engineering And Research, Inc. "Review of Structural Methods Used to Evaluate the Integrity of the Trans-Alaska Pipeline," *for* Alyeska Pipeline Service Company, 1 July 1995.
- Berkeley Engineering And Research, Inc. "Coke Drum Material Crack Growth Tests," *for* Chevron Research & Technology Company, 2 Aug. 1995.
- Berkeley Engineering And Research, Inc., SSD Engineering Consultants, Inc. "Fracture Evaluation of Fillet Welded Pipe Sleeves," *for* Alyeska Pipeline Service Company, 01 July 1994.
- Stevick, G.R. "Failure of Welds at Elevated Temperatures," *Welding Research Council Bulletin 390*, Welding Research Council, April 1994.
- SSD Eng Consultants, Inc., Berkeley Engineering And Research, Inc. "Structural Serviceability of the Salcha River Crossing," *for* Alyeska Pipeline Service Company, 17 Nov. 1993.
- Stevick, G.R., Cuzzillo, B.R.. "Batch-Reactor Heater-Coil Thermal & Fatigue Analysis," *for* Chevron Research and Technology Company, Inc., 25 Aug. 1993.
- Finnie, I., Stevick, G.R., Ridgley, J.R.. "Influence of Impingement Angle on the Erosion of Ductile Materials." *Wear* 152 (1992): 91-98.
- Stevick, G.R. "Stress Analysis of Hospital Bed Frame Components," *for* American Life Support Technology, 01 July 1991.
- Stevick, G.R., Finnie, I. "Stress Concentrations Resulting from Longitudinal Butt-Welds in Piping at Elevated Temperatures." *Creep in Structures*. (Ed. M. Zyczowski), Berlin: Springer-Verlag, 1991. 629-636.
- Stevick, G.R., Finnie, I. "Failure Assessment of Weldments at Elevated Temperatures." *Mechanical Behavior of Materials-VI, Vol 2*. Ed. M. Jono, T. Inoue. Oxford: Pergamon, 1991. 149-154.
- Stevick, G.R. "Redesign of an 8000 psi Test Vessel Using Bolted Construction" (2 reports), *for* SAIC Rock Mechanics Laboratory, 5 Sept. 1990, 12 Dec. 1990.
- Marsili, D., Stevick, G.R. "Ductile Fracture Protection of the Canyon Reef Carrier Natural Gas Pipeline," *Proceedings of the 65th annual Society of Petroleum Engineering Conference, New Orleans, Louisiana*, Sept. 1990.
- Stevick, G.R. "Structural Analysis of Fluidized Catalytic Cracking Unit Regenerator Internals," *for* Chevron USA El Segundo Refinery, 22 June 1990.
- Stevick, G.R. "High Pressure Toxic Filter/Pressure Vessel Design," *for* Filterdyne Systems, Inc., 17 Jan. 1990.

- Stevick, G.R. "Whitney Canyon/Carter Creek, WY - Gathering System H2S Risk Assessment," *for* Chevron Engineering Technology Department, Nov. 1988.
- Stevick, G.R. "Crane Turret Bolt Failure Analysis," *for* Dave's Mobile Crane Service, Los Altos, CA, June 1988.
- Stevick, G.R. "El Segundo, CA - Buckling Integrity of Column C-6 for Wind and Earthquake Loads," *for* Chevron Engineering Technology Department, June 1988.
- Stevick, G.R., Burke, B.G. "An Experimental Assessment of The Damping Provided By Chain Dampers on a Tall, Slender Stack," *Proceedings of the International Chimney Conference, London, England.* April 1988.
- Stevick, G.R., Ebert, W. A. "Recommended Practice, RP-33, Vibration Guidelines," *for* Chevron Engineering Technology Department, Dec. 1987.
- Stevick, G.R. "Diffusion of Gasoline Vapors Within the Annulus of Double-Wall Underground Storage Tanks," *for* Chevron Engineering Department, Nov. 1987.
- Stevick, G.R. "Gaviota, CA - Onshore Pipelines Weld Flaw Acceptance Criteria," *for*, Chevron Engineering Technology Department, June 1987.
- Stevick, G.R. "DNL Construction Crane Failure," *for* George Ashford & Associates, Honolulu, Hawaii, May 1987.
- Stevick, G.R. "Fiberglass Underground Storage Tank Design Methodology for External Loads," *for* Chevron Engineering Department, Nov. 1986.
- Stevick, G.R., Ebert, W.A. "El Paso, TX - Failure Analysis and Design of a New FCCU Flue Gas Cooler," *for* Chevron Engineering Department, May 1986.
- Stevick, G.R. "Richmond, CA - Isomax Plant Compressor Valve Failure and Redesign, K-950, K-960," *for* Chevron Engineering Department, April 1986.
- Stevick, G.R., Soemantri, S., Finnie, I. "An Analysis of the Loaded Abrasive Column type Wear Tester." *Wear* 101 (1985): 77- 80.
- Stevick, G.R. "Heber – Geothermal Pump Seals," *for* Chevron Engineering Department, Jan. 1985.
- Stevick, G.R. "Gaviota, CA - Fatigue Analysis and Redesign of the 40.5 inch Diameter Gas Compressor Pistons," *for* Chevron Engineering Department, Jan. 1985.
- Stevick, G.R. "Vapor Recovery Piping – Taft Sec. 36B," *for* Chevron Engineering Department, Aug. 1984.
- Stevick, G.R., Burke, B.G. "Tension Leg Platform Production Riser Crack Growth Analysis," *for* Chevron Engineering Department, May 1984.

Stevick, G.R. "Platform Grace Gas Pipeline – Ductile Fracture," *for* Chevron Engineering Department, 2 April 1984.

Stevick, G.R. "20 inch Casing Connector Fatigue Life Evaluation for the Manteo Block," *for* Chevron Engineering Department, April 1984.

Stevick, G.R. "Platform Hidalgo Gas Pipeline – Ductile Fracture," *for* Chevron Engineering Department, March 1984.

Cheng, W., Finnie, I., Stevick, G.R.. "Prediction of Stress Intensity Factor for an Internal Circumferential Crack at a Butt-Weld Between Cylinders Using the Plane Strain Solution." *Journal of Engineering Materials and Technology* 106 (1984): 21-24.