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Experience

As a mechanical engineer specializing in failure analysis and risk management, Dr. Grewal provides engineering consulting services to private and public entities. His work broadly deals with the intersection of engineering with humans and society. He applies knowledge of engineering, science, technology and medicine to multi-disciplinary investigations of accidents and failures to help clients manage risk and make better products. He has investigated a wide range of failures and accidents ranging from consumer products to disasters of national significance.

Dr. Grewal's work generally covers four areas: failure analysis, accident reconstruction, injury biomechanics, and product design. His specific expertise is in the design and analysis of machines, electro-mechanical systems, and biomechanical devices. He has reconstructed accidents involving structural failures, fires, explosions, and transportation accidents such as aviation, marine, rail, off-road, and automotive accidents. He has investigated many "everyday" product failures and accidents involving sports equipment, appliances, medical devices, firearms, and automobile systems.

Dr. Grewal uses his knowledge and experience in product failures to work with clients to develop engineered products for both consumers and industry. For example, he has worked on the development of ski and snowboard equipment, audio products, natural gas powered trucks, surgical tools, and dental products. In addition to product design, he assists clients with world-wide government regulatory matters regarding their products.

Prior Employment

Instructor in the Department of Mechanical Engineering at U.C. Berkeley
Founder and Principal at Principia Engineering Inc
Managing Engineer at Exponent Failure Analysis Associates
Process Development Engineer at IBM

Education and Credentials

Ph.D. (Mechanical Engineering/Biomechanics), University of California, Berkeley, 2002
M.S. (Mechanical Engineering/Biomechanics, Product Design), Stanford University, 1994
B.S. (Mechanical Engineering), University of California, Berkeley, 1990
ASME Farber Award, 1990
Registered Professional Mechanical Engineer, California, #M28309
Registered Patent Agent, U.S. Patent and Trademark Office, #45766
PADI certified Open Water Diver
Private Pilot, Single Engine Land

SAE TopTec on automotive accident reconstruction, 1994, 16 hours.
"Statistical Analysis of Experimental Data and Design of Experiments," seminar at Eastern Michigan University, 2001, 32 hours.
Oxy-Acetylene and Arc Welding, vocational training at The Crucible, 2002.
TIG Welding, vocational training at The Crucible, 2003.

"Occupant and Vehicle Kinematics in Rollovers," SAE Professional Development Program, 2004, 1.30 CEU (IACET), 16 hours.

"Current Issues in Using Crash Injury Data," SAE Professional Development Program, 2005, 0.65 CEU (IACET), 8 hours.

"Fire Investigation 1A and 1B," California State Fire Marshal's Office, 2006, 80 hours.
Leadership San Francisco, class of 2010.

Dassault Systemes SolidWorks training, Hawk Ridge Systems, 2016, 32 hours.

Selected Publications and Presentations

"Simulation of BioSID Head-Neck Motions," *Safety Technology*, Society of Automotive Engineers, Paper #940909, 1994.

"Evaluation of a Proposed ATV Design Modification," Society of Automotive Engineers International Congress and Exposition, Paper #940276, February 1994.

"Analytical Study of the Biomechanics of Lower Leg Injury in Snowboarding During a Forward Fall," 16th International Symposium on Ski Trauma and Skiing Safety, Niigata, Japan, April 2005.

"Experimental Measurement of Selected Snowboard Mechanical Properties," *Journal of ASTM International*, Volume 3, Issue 8, September 2006. This paper was also presented at the 16th International Symposium on Ski Trauma and Skiing Safety at Niigata, Japan in April 2005, and in an updated form at the 7th International Conference on Sports Engineering at Biarritz, France in June 2008.

"Ball Mill Maintenance," *International Cement Review*, Tradeship Publications Ltd., Surrey, U.K., May 2008, pp. 120-122.

"What to Do When a Product Is Implicated in a Fire," *Defense Comment*, Association of Defense Counsel of Northern California and Nevada, Spring 2013, pp. 15-18.

"Civil Liability Arising Out of the Commercial Ownership and Operation of Drones," *For the Defense*, Defense Research Institute, April 2016, pp. 16-21.