



Roger L. McCarthy, Ph.D., P.E.

Professional Profile

Dr. Roger L. McCarthy is the founder and owner of McCarthy Engineering. Dr. McCarthy serves on the Board of Shui on Land (SOL), Ltd., (瑞安房地产) which is publicly traded (stock code 0272) on the Hong Kong Exchange. SOL won the Hong Kong Corporate Governance Excellence Award in 2007 and two awards from “1st Asian Excellence Recognition Awards 2011” on Investor Relations presented by Corporate Governance Asia Magazine.

Dr. McCarthy specializes in the analysis of Mechanical Design, and the analysis of incidents, failures and accidents involving issues related to mechanical, machine, and mechanism design, particularly as it involves the engineering of the man/machine interface, control, and fire/explosion/heat transfer. He also analyzes associated issues related to product design and intellectual property issues related to design. He is extensively published in the area of vehicular design, vehicle component design, risk analysis related to mechanical design, and the quantitative analysis of the reliability of complex systems. In his career he has directed the scientific testing of over 1,000 human subjects.

Dr. McCarthy has personally investigated many of the major disasters of modern times, including the loss of the Amoco Cadiz, the collapse of the Kansas City Hyatt walkways, the grounding of the Exxon Valdez, the explosion and loss of the Piper Alpha oil platform in the North Sea, the fire and explosion on the semi-submersible Glomar Arctic II, and the bombing of the Murrah Federal Building in Oklahoma City amongst others. Most recently he was asked to serve on the National Academy of Engineering - National Research Council Committee for the Analysis of Causes of the *Deepwater Horizon* Explosion, Fire, and Oil Spill to Identify Measures to Prevent Similar Accidents in the Future and the National Academies Panel on Air and Ground Vehicle Technology. In 1996, Dr. McCarthy testified for multiple days in the second Menendez brothers murder trial on the crime reconstruction he performed for the prosecution, which ended in their conviction.

Dr. McCarthy was formerly employed by Exponent, Inc., (NASDAQ symbol “EXPO”), headquartered in Menlo Park, California where, during his 30 year tenure, he was variously CEO, Chairman and Chairman Emeritus. Dr. McCarthy was formerly Chairman of Exponent Science and Technology Consulting Co., Ltd. (Hangzhou) 毅博科技咨询(杭州)有限公司, a wholly owned subsidiary of Exponent, Inc., which he founded in 2005 to expand Exponent’s services to China. Dr. McCarthy joined Exponent, then Failure Analysis Associates, Inc., (FaAA) in 1978, and retired in 2009. When Dr. McCarthy retired from Exponent it employed more than 750 full-time staff, including more than 500 degreed professionals, of which 250 held doctorates in their fields, and maintained eighteen offices in the U.S. and three international offices. He became a Director and Vice-President in 1980, and President and Chief Executive Officer in 1982, a position he held until 1996, and Chairman of the Board in 1986, a position he held until 2005. In 1989, Dr. McCarthy reincorporated Failure Analysis Associates, Inc. in Delaware as The Failure Group, Inc. In 1990, Dr. McCarthy took The Failure Group, Inc. public on the NASDAQ exchange. Also in 1990, Dr. McCarthy formed Failure Analysis B.V. in the Netherlands to

expand Exponent's operations to Europe. In 1998, The Failure Group, Inc. changed its name to Exponent, Inc.

Dr. McCarthy is a Registered Professional Mechanical Engineer in the State of California, #M20040; a Registered Professional Mechanical Engineer in the State of Arizona, #13684; a registered Professional Mechanical Engineer in the State of Ohio, #70487; and a Registered Professional Engineer in the State of Georgia, #27543. He was a commissioned officer in the U.S. Army Ordnance Corps, trained at Aberdeen Proving Ground, and was honorably discharged as a Captain in 1980. Dr. McCarthy was formerly a member of the Army Science Board.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, Massachusetts Institute of Technology, 1977

Mech. E., Mechanical Engineering, Massachusetts Institute of Technology, 1975

S.M., Mechanical Engineering, Massachusetts Institute of Technology, 1973

B.S.E., Mechanical Engineering, University of Michigan (*summa cum laude*), 1972

A.B., Philosophy, University of Michigan (with High Distinction), 1972

Phi Beta Kappa, James B. Angell Scholar, graduated with "high distinction," *summa cum laude*, the Outstanding Undergraduate in Mechanical Engineering in 1972, a National Science Foundation Fellow, and Sigma Xi

Commencement Speaker for the University of Michigan College of Engineering Graduation, April 2008

Dr. McCarthy is one of the ~165 mechanical engineers elected by his peers to the National Academy of Engineering.

Dr. McCarthy served on the Visiting Committee of MIT's Mechanical Engineering Department for 20 years and for four years on the Department of Materials Science & Engineering Advisory Group at Stanford University. He has served for the last 20 years on the External Advisory Boards of the Department of Mechanical Engineering at the University of Michigan.

In 1992, then President Bush appointed Dr. McCarthy to a two-year term on the President's Commission on the National Medal of Science.

Outstanding Civilian Service Gold Medal awarded by U.S. Army (1998)

Tech Museum of Innovation Board, 1991–1994 (member); Safety Engineering and Risk Analysis Division, American Society of Mechanical Engineers(ASME), 1997 (Chair); ASME Board of Safety Codes and Standards 1995-2008; U.S. Army SBIR Quality Awards Committee, 1993–1998 (Chairman); ASME Passenger Transport Safety Committee, 2001-2003 (Chair), ASME Nancy Deloye Fitzroy & Roland V. Fitzroy Medal Committee, 2011 – present, American Society of Metals (member); American Society of Mechanical Engineers (member); Society of Automotive Engineers (member); American Society for Testing and Materials (member); Human Factors and Ergonomics Society (member); American Society of Heating, Refrigeration, and Air-Conditioning Engineers (member); National Fire Protection Association (member); Society for Risk Analysis (member)

Publications

Winter DC, et.al. *Macondo Well–Deepwater Horizon Blowout: Lessons for Improving Offshore Drilling Safety*, THE NATIONAL ACADEMIES PRESS, Washington, D.C., Dec 2011. ISBN 978-0-309-22138-2

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Reza A, McCarthy RL. *Measurements to determine the effect of selected additives on the detonability of ANFO mixtures*. Proceedings, 25th Annual Conference on Explosives and Blasting Technique, Nashville, TN, February 7–10, 1999.

Ayres TJ, Wood CT, Schmidt RA, McCarthy RL. *Risk perception and behavioral choice*. International Journal of Cognitive Ergonomics 1998; 2:35–52.

Arndt SR, Ayres TJ, McCarthy RL, Wood CT, Young DE. *Warning labels and accident data*. Proceedings, 42nd Annual meeting of the Human Factors and Ergonomics Society, pp. 550–553, Chicago, IL, October 1998.

Wood CT, McCarthy RL, Arndt SR. *Using risk analysis to reduce the hazards on playgrounds*. Proceedings, National Manufacturing Week Conference, Chicago, IL, March 1998.

McCarthy RL, Ayres TJ, Wood CT. *Risk and effectiveness criteria for using on-product warnings*. Ergonomics 1995; 38:2164–2175.

Ayres TJ, Fowler G, McCarthy RL, Merala R. *Foot injuries and foot protection on all-terrain vehicles*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Safety Engineering and Risk Analysis, November 1994; 2.

McCarthy GE, Ray RM, McCarthy RL. *In-use effectiveness of child restraints and seat belts for children from birth through age four*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Safety Engineering and Risk Analysis, November 1994; 2.

McCarthy GE, McCarthy RL. *Safety evaluation methodologies for manufacturers of consumer products*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Safety Engineering and Risk Analysis, November 1994; 2.

Fowler GF, Fries RH, McCarthy RL, Forouhar FA, Larson RE. *Steady-state and transient response of selected All-Terrain Vehicles (ATVs)*. SAE 940277, Society of Automotive Engineers International Congress and Exposition, February 1994.

Piziali RL, Fowler GF, Merala R, Grewal DS, McCarthy RL. *Evaluation of a proposed ATV design modification*. Paper 940276, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, February 1994.

McCarthy RL, Wood CT, Ayres TJ. *Human subject testing in the development of warning labels*. Proceedings, ABA National Institute, Product Warnings, Instructions and User Information, Washington, DC, January 1994.

McCarthy RL, Ayres TJ, Wood CT, Robinson JN. *Risk-based warning design*. Proceedings, ABA National Institute, Product Warnings, Instructions and User Information, Washington, DC, January 1994.

Donelson AC, Ray RM, McCarthy RL. *Statistical analysis of vehicle rollover: Causal modeling*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

McCarthy RL, Fowler G, Ayres TJ, Gross MM. *An examination of the consent decree and its impact on all-terrain vehicle risk*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

McCarthy RL, Anderson LW, Donelson AC. *An examination of the 1977 Model Year FMVSS 301 effect on subcompact car rear-impact fire risk*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

McCarthy RL, Padmanaban J, Weiss JM. *An analysis of acceptable motor vehicle risk variation established by the National Highway Traffic Safety Administration*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

Donelson AC, Beyer RR, Selow WV, Parthasarathy V, McCarthy RL. *The 'Funny Spare': An examination of risks and benefits*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

Wood CT, McCarthy RL, Fowler G, Robinson JN. *A comparative analysis of the annual injury risk for motorized vehicular recreation*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

Ayres TJ, Gross MM, McCarthy RL. *A retrospective on attempts to reduce vehicular risk through operator training*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993.

Piziali RL, Ayres TJ, Paver JG, Fowler G, McCarthy RL. *Investigation of the net safety impact of an occupant protection system for all-terrain vehicles*. Paper 930208, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, March 1993.

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Piziali RL, Paver JG, Merala R, Fries R, Ayres TJ, Fowler G, McCarthy RL. *Evaluation of occupant protection systems for all-terrain vehicles*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Anaheim, CA, November 1992.

Ayres TJ, Gross MM, Wood CT, McCarthy RL, Weiss J. *Applications of risk analysis to off-road vehicles*. Proceedings, Society of Automotive Engineers Off-Highway Congress, September 1992.

Ray RM, Anderson LW, Padmanaban J, McCarthy RL. *Risk analysis of home appliance fires*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Atlanta, GA, December 1991.

Weiss JM, McCarthy RL, Kost G, Merala RJ, Robinson JN. *Accident mode risk analysis of agricultural tractors*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Atlanta, GA, December 1991.

Ayres TJ, Gross MM, Fowler G, McCarthy RL, Kalinowski A, Lau E. *Evaluation of potential safety modifications by review of accident reports*. Proceedings, 35th Annual Meeting of the Human Factors Society, San Francisco, CA, Sept. 1991.

McCarthy RL, Taylor RK, Kost G, Robinson JN, Wood CT. *A comparative analysis of industrial lift truck (forklift) accidents*. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Dallas, TX, November 1990.

McCarthy RL, Conroy C. *Discussion of the HSRC Automatic Seat Belt Study*. Proceedings, 34th Annual Conference, Association for the Advancement of Automotive Medicine, Scottsdale, AZ, October 1990.

McCarthy GE, Davis CS, Lange RC, McCarthy RL. *The impact of the 1968 Evaporative Loss Standard on automotive risk*. American Society of Mechanical Engineers Winter Annual Meeting, San Francisco, CA, 1989.

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McCarthy GE, McCarthy RL, Swanger LA. *Reliability and service life of steel truck wheels*. 1986 Proceedings, Annual Reliability and Maintainability Symposium, Las Vegas, NV, January 1986.

McCarthy RL, Robinson JN, Brand I. *Quantitative safety comparison of three hay baling technologies*. Proceedings, 1985 Winter Meeting, American Society of Agricultural Engineers, Chicago, IL, December 1985.

McCarthy RL, Sanford SB. *Advanced techniques in accident investigation*. Proceedings, 24th Annual American Society of Safety Engineers Professional Development Conference and Exposition, San Diego, CA, June 1985.

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McCarthy RL. *An engineering safety analysis of the steel belted radial tire*. Society of Automotive Engineers Paper #800840, June 1980.

McCarthy RL, Finnegan JP. *Multipiece and single piece rims: The risk associated with their unique design characteristics: Phase III*. Proceedings, National Wheel and Rim Association, June 1980.

McCarthy RL, Besuner PM. *A simple technique to improve the allocation of safety inspection resources*. Proceedings, 4th International System Safety Conference, San Francisco, CA, July 1979.

McCarthy RL, Finnegan J, Besuner PM, Sorenson KG. *An engineering analysis of the risk associated with multipiece wheels*. Occupational Safety and Health Administration, Docket No. S-005, June 1979.

Buckley S, McCarthy RL. *Planar thermic elements for thermal control systems*. Journal of Dynamic Systems, Measurement and Control 1977; 99(1), Series G, March.