

Exponent®
Engineering & Scientific Consulting

Steve Andrew, P.E.

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Professional Profile

With a background in mechanical engineering, Mr. Andrew has analyzed hundreds of mechanical and material failures in the past 30 years. In particular, he has attained specialized competence in the investigation of machinery and equipment failures, machine guarding, fall protection, lockout/tagout, industrial and occupational safety, safety management, transportation safety, OSHA and ADA evaluations, accident reconstruction, and fire protection. He has evaluated the operating and safety characteristics of equipment, including forklifts and other material handling equipment, conveyors, aerial lifts, buses, elevators/escalators, excavators, cranes, and other heavy machinery.

Mr. Andrew has experience in evaluating worker, equipment, and facility safety. He has assisted clients incorporate safety features into designs as well as help companies develop worker safety programs. He has performed safety audits at production facilities. He has taken post graduate courses in safety including: Safety Management, Fall Protection, Managing Contractor Safety - Implementing an Effective Contractor Safety Management Program, Personnel Hoists, and Employee Elevators.

Mr. Andrew has performed research in the behavior of materials. His research has addressed many issues relating to the fatigue and fracture behavior of mechanical systems in the electric power generation, chemical, and aviation industries. He is a key contributor to Exponent's miniature material sample removal and testing technology as applied to complement life assessment and maintenance planning of engineering structures.

Academic Credentials & Professional Honors

M.S., Mechanical Engineering, Purdue University, 1985

B.S., Mechanical Engineering, Purdue University, 1982

Tau Beta Pi National Engineering Honorary Society

Pi Tau Sigma National Mechanical Engineering Honorary Society

Outstanding Survey Paper of 1992, American Society of Mechanical Engineers Pressure Vessels and Piping Division

First Place, American Institute of Aeronautics and Astronautics Minta Martin Graduate Student paper competition, midwest section, 1982

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Licenses and Certifications

Professional Engineer Mechanical, California, #24806

Professional Engineer, New York, #092735

Certified Safety Manager (CSM)

OSHA #511 Occupational Safety and Health Standards for General Industry

Certified Forklift Operator (CFO)

Prior Experience

McDonnell Douglas Corporation, 1978-1981

Graduate Research Assistant, Purdue University, 1982-1985

Professional Affiliations

B11 Standards Development Committee

B11.0 subcommittee

B11.19 subcommittee

American Society of Mechanical Engineers

American Society of Safety Professionals

Publications

"Thermal Constraint Considerations in Design of a Heat Recovery Boiler," 7th International Conference and Exhibition of Operation Pressure Equipment, Sydney, Australia, April 2-4, 2003 (with R.D. Caligiuri, J.R. Foulds, and R.A. Sire).

"Executive Mathematics," Internet e-learning course, Digital Think, San Francisco, CA, 2003.

"Hydrotesting of Fossil Plant Components," Proceedings, 7th International Conference and Exhibition of Operating Pressure Equipment, Sydney Australia, April 2-4, 2003 (with J.R. Foulds and R. Viswanathan).

"Analysis of Rail Cracking and Development of a Rail Screening Guideline Based on Fracture Mechanics Principles," Fatigue & Durability Assessment of Materials, Components & Structures, Proceedings of the 5th International Conference of the Engineering Integrity Society, Queen's College, Cambridge, UK, April 7-9, 2003 (with R.D. Caligiuri, R.A. Sire, and T.K. Parnell).

"Evaluation of a Failure in a Chlorine Production Facility," Proceedings of IMECE2001, 2001 ASME International Mechanical Engineering Congress and Exposition, November 2001, New York, NY (with R. Caligiuri, L. Eiselstein, and T. Parnell).

"Unit Specific Evaluation of Steam Turbine Rotors Using Miniature Sample Removal and SAFER-PC," Fifth International Conference on Engineering Structural Integrity Assessment-Structural Integrity in the 21st Century, The Lifetime of Plant Structures and Components: Evaluation, Design, Extension and

Management, J.H. Edwards et. al.(eds.), EMAS Publishing , U.K., September 2000, pp. 283-290 (with J. Foulds, S. Srivastav, and G. Beckerdite).

"Mechanical Failure of a Pressure Vessel: Causes and Insurance Coverage Implications," Proceedings of Case Histories on Integrity and Failures in Industry, V. Bicego et. al.(eds.), Milan, Italy, September 28-October 1, 1999 (with R. Caligiuri, R. Huet, and A. Reza).

"Fundamentals of Engineering Video Review," Video Review Course, Professional Publications, Belmont, CA, 1999.

"The FATDAC Code for Fatigue Database Analysis," Computerization and Networking of Materials Databases: Volume III, K.W. Reynard and T.I. Barry (eds.), ASTM STP 1140, American Society for Testing and Materials, Philadelphia, PA, 1992.

"Technical Basis for a Revised Fatigue Crack Growth Rate Reference Curve for Ferritic Steels in Air," Transactions of the ASME, Vol. 114, February 1992, pp. 80-86 (with E.D. Eason, J.D. Gilman, and D.P. Jones).

"A Review of Penetration Mechanisms and Dynamic Properties of Tungsten and Depleted Uranium Penetrators," Proceedings, Tungsten and Tungsten Alloys—Recent Advances Symposium, The Metallurgical Society, E. Chen (ed.), 1991 (with R.D. Caligiuri and L.E. Eiselstein).

"Analysis of Pressure Vessel Steel Fatigue Tests in Air," Nuclear Engineering and Design, Vol. 115, pp. 23-30, 1989 (with E.D. Eason, S.B. Warmbrodt, E.E. Nelson, and J.D. Gilman).

"Three-Dimensional Measurements of Fatigue Crack Opening and Closure," Basic Questions in Fatigue: Volume II, ASTM STP 924, R.P. Wei and R.P. Gangloff, eds., American Society for Testing and Materials, 1985 (with S.K. Ray and A.F. Grandt).

Books

The History of Transit Buses in the United States, No. SP-842, Society of Automotive Engineers, 1990 (with S. M. Mandell and B. Ross).

Book Chapters

Chapter 53 - Pressure Vessels, Mechanical Engineering Reference Manual, Professional Publications, Inc., 2001, Belmont, CA.

Presentations

"Air Disasters," Lockheed Martin Palo Alto Colloquia, Palo Alto, CA, September 1999.

"A Review of High Strain Rate Properties and Penetration Mechanisms of Depleted Uranium and Tungsten Alloys," Army Research Development and Engineering Command/Army Research Office Workshop on Metallurgical Aspects of Deformation/Failure Mechanisms in (the Terminal Ballistics of Heavy Metal) Kinetic Energy Penetrators, Picatinny Arsenal, Dover, NJ, April 1990 (with R.D. Caligiuri and L.E. Eiselstein).

"Technical Basis or Revised Fatigue Crack Growth Rate Reference Curve for Ferritic Steels in Air," Winter Annual Meeting, American Society of Mechanical Engineers, December 1988 (with E.D. Eason, J.D. Gilman, and D.P. Jones).

"Analysis of Pressure Vessel Steel Air Data," Invited paper presented at the 9th International Conference

on Structural Mechanics in Reactor Technology, Lausanne, Switzerland, August 1987 (with E.D. Eason, S.B. Warmbrodt, and E.E. Nelson).

Project Experience

Assisted a manufacturer in the selection and evaluation of various guarding technologies to improve the safety of machinery in the corrugated cardboard manufacturing industry. The end product was an improved safety system that was incorporated into future products and was offered as a retrofit to previous production.

Performed safety analyses on dairy and poultry equipment. Applicable US and international machinery, risk assessment, and other safety standards were applied. These efforts resulted in specific design recommendations to the manufacturers.

Assisted a multi-national aerospace component manufacturer develop a safety program that was implemented worldwide. This program addressed a safety issue for which no specific standards were available and which impacted the testing of thousands of different products at over a hundred facilities. Both engineering analysis and safety expertise were applied to develop a program that was deployed across multiple cultures and languages. This program involved developing test procedures, writing computer programs, and performing safety audits, making recommendations, and developing safety training programs.

Performed safety audits for equipment manufacturers and facility owners. The results of these audits were improved equipment and processes.

Evaluated the effectiveness of different means of protecting line haul bus drivers from assailants. This study considered various environmental and human factors that affect driver safety. The effectiveness of driver shields and their overall impact on bus safety was evaluated.