

R. KEVIN SMITH, P.E., D.F.E.
 Mechanical Engineering Safety and Design Consultant
President of R. K. Smith Engineering Inc.
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CURRENT EMPLOYMENT

President of R. K. Smith Engineering Inc. August 1997 to present

Consulting Services specializing in mechanical engineering safety. On site and laboratory investigations of consumer and industrial product related accidents. Design, safety analysis, and testing of machinery, mechanical components, consumer and industrial products. Human factors considerations in design. Forensic aspects of engineering design. Computer animation and simulation of machine systems. Design-for-safety consultation. Investigation, testing, accident reconstruction, and human factors analysis regarding specific issues relating to and resulting from analysis of equipment including:

Forklift Guarding/Safety/Braking/Stability	Rough Terrain/ telescoping boom forklifts	Lifting Devices/ rigging equipment
Powered Industrial Trucks, lift truck attachments	Machine Guarding, Warnings and Controls/Interlocks	Hydraulic Circuit design for safety
Lift Truck Safety Systems, Devices	Visibility of industrial and construction vehicles	Control Systems/ Safety
Fall Protection & Equipment	Conveyor safety	Warning Signs
Golf car/ATV/UTV safety and stability	Lift truck and Aerial Lift Operator Training	OSHA Regulations/Citations/ Investigations
Ladder design/ safety/ A14 testing	Manlifts (ANSI A90.1/OSHA 1910.68)	Paper Machinery/Converting Safety
Skid Steer Loaders/Operator Presence Systems	Hazard Analysis/Risk Assessment and reduction	Construction Equipment Safety including cranes, skid/steer loaders, compactors, backhoes, wheel loaders, bulldozers
Heavy equipment Access Systems/ ROPS Aerial Work Platforms (Booms and Scissors)	Stability testing and accident reconstruction involving telescopic material handlers	Loading dock plates/ truck restraints, loading dock safety/procedures
Laboratory Product Testing Safety Inspections/Audits	Mobile Elevating Work Platform (MEWP) stability testing and A92 certification consulting	Industrial Tools/Processing lines/safeguards Laboratory Testing including full scale tilt table testing of vehicles
Lawn and Garden Equipment (stability, controls, safe operation)	Woodworking Equipment: Table Saws, sliding/compound miter saws, portable saws	Overhead Doors including: Consumer and Commercial openers and safety devices
Consumer Products Including ladders, stools, camping chairs, hand trucks, lawnmowers, food processors	Prevention Through Design (PTD) Including ANSI/ASSE Z590.3, ISO 12100, ISO 14121	Aerial Work Platforms:Truck Mounted, MEWPS, Booms and Scissor Lifts. Stability Testing, A92 Training
Restaurant and Food Processing Equipment	Electromechanical and Hydraulic Systems	Visibility of industrial and construction machinery, mirrors, cameras
Hazard Analysis/Risk Assessment and reduction	Golf Car/ATV/UTV safety and stability	Human Factors and Biomechanical Considerations in Product Design
Plastic Processing/Injection Molding Machine/Granulating safety	Industrial Racking Safety	Scaffold Safety

EDUCATION

Master of Mechanical and Aerospace Engineering

Illinois Institute of Technology, Chicago, Illinois
(Major in Design/Manufacturing) 1997

Bachelor of Science in Mechanical Engineering

Illinois Institute of Technology, Chicago, Illinois, 1982

University of Illinois-Urbana/Champaign

Undergraduate Mechanical Engineering Curricula (2 full years)
Academic Honors - Illinois State Scholar

CERTIFICATIONS

Registered Professional Engineer since 1986

Illinois License No. 062-043198, Indiana P.E. license PE11900557

Board Certified Diplomate in Forensic Engineering, Senior Member, NAFE (National Academy of Forensic Engineers, member number 1088S

IPAF (International Powered Access Federation) certified powered access license (PAL) for Mobile Elevating Work Platforms Type 3a, 3b (boom & scissor lifts). AOP/009580

PROFESSIONAL SOCIETIES

Illinois Society of Professional Engineers
National Society of Professional Engineers
American Society of Safety Engineers
American Society of Mechanical Engineers
Society of Automotive Engineers

SAFETY/DESIGN STANDARDS PARTICIPATION

Member - **ASME/ANSI B56.1** (since 1984) now **ITSDF B56.1** (since 2005)

"Safety Standard for Low Lift and High Lift Trucks"

-Past Chairman of Ad Hoc Committee to Study Forklift Truck Stability

-Chairman of Task Force to study fall protection

Member- Underwriters Laboratory Standards Technical Panel **STP 83**, covering **UL 558**, Standard for Safety for Industrial Trucks, and **UL 583**, Standard for Safety for Electric-Battery-Powered Industrial Trucks

Member- **ANSI/SIA A92.5 and A92.6** Standard for Self-Propelled Elevating Work Platforms Member- **ANSI/SIA A92.20, A92.22, A92.24** Design, Safe Use, and Training for MEWPs (mobile elevating work platforms) from inception thru March 2022

Member- **ITSDF B56.6** Safety Standard for Rough Terrain Lift Trucks

Member- ANSI MH30.1 Canvass Committee Alternate Delegate
(Design, Testing, and Utilization of Dock Leveling Devices) (2022)

Member- ANSI MH30.3 Canvass Committee Alternate Delegate
(Design, Testing, and Utilization of Vehicle Restraining Devices)(2022)

EMPLOYMENT HISTORY

Employer: Allis-Chalmers Industrial Truck Division, Matteson, Illinois
Business: Design and manufacture of powered industrial trucks including electric powered and internal combustion engine powered sit down rider, stand up rider, pallet and order picker forklift trucks.
Position: Design Engineer, Test and Reliability Engineer
Duration: January 1979 to January 1982
Work Experience: Design of masts and special attachments for forklift trucks. Complete vehicle and component testing.

Design: Overhead guards, load backrest extensions, test fixture for fatigue testing, impact energy hold-down device for forklift trucks under naval attack per Military Specs, hydraulic circuit design, computer controlled test cell, special attachments for forklifts.

Testing/Reliability: Brake systems and components, hydraulic systems and components, engine performance, sound level/exhaust emissions, overhead guard strength, load backrest strength, fatigue testing of masts and axles, mast stress/deflection, forklift stability/visibility.

Employer: Institute for Advanced Safety Studies, Niles, IL
Business: A not-for-profit safety research consortium
Position: Research and development, Technical Consultant
Duties: Coordination of safety research programs
Work Experience: Science/engineering consultant regarding analysis of operator restraints on forklifts including biomechanical considerations in overturns, visibility considerations with operator restraints. Design of falling object preventive structures for forklift trucks. Outline of project/test protocol for various safety research contracts/proposals.
Duration: 1984 to 1992.

Employer: Prairie State College, Chicago Heights, IL
Position: Adjunct Faculty Member, Department of Math and Computer Science
Duration: January, 2000 to 2016
Duties: Instructor for course entitled: General Education Statistics, Geometry, College Algebra

Employer: Triodyne Inc., 5950 W Touhy Ave., Niles, Illinois
Business: Safety and Design Engineering Consultants
Position: Principal Mechanical Engineer
Work Experience: On site and laboratory investigations of consumer and industrial product related accidents. Design, safety analysis, and testing of machinery, mechanical components, consumer products. Human factors considerations in design. Forensic aspects of engineering design. Computer animation and simulation of machine systems.

Duration: January 1982 to August, 1997

PRE-COLLEGE WORK EXPERIENCE

- 1 . Concrete construction/surveying.
- 2 . Cook/Manager of restaurant (includes operation/repair of numerous types of restaurant and food processing equipment. Types of equipment that were operated: Gas and electric deep fat fryers, ovens, grills, griddles, slicers, meat grinders, dishwashers.

PROFESSIONAL TALKS / INVITED LECTURES / PAPERS

1. "Elements of Expert Safety Analysis," guest lecturer, Illinois Institute of Technology, Chicago, IL, October 22, 1982.
2. "Forklift Truck Safety," guest lecturer, Illinois Institute of Technology, Chicago, IL, October 29, 1982.
- 3 . "Paper Winder Machine Safety," guest lecturer, Illinois Institute of Technology, Chicago, IL, November 5, 1982.
- 4 . "Forklift Truck Safety," guest lecturer, Illinois Institute of Technology, Chicago, IL, Spring 1983.
- 5 . "Seminar in Design for Safety," invited lecturer, Beloit-Jones Division (Paper Machine Manufacturer), Dalton, MA, May 30-31, 1985.
- 6 . "Design for Safety in Machines," guest lecturer, Illinois Institute of Technology, Chicago, IL, January, 1993.
- 7 . "Operator Restraint Considerations in Forklift Design for Safety," guest lecture in the course **Design for Safety in Machines**, Illinois Institute of Technology, Chicago, IL, January 1994
- 8 . "Safety Principles Applied to Papermaking Machinery", guest lecture in the course **Design for Safety in Machines**, Illinois Institute of Technology, Chicago, IL, May 1994
- 9 . "Product Liability Law for Design Engineers", guest lecture in the course **Design for Safety in Machines**, Illinois Institute of Technology, Chicago, IL, May 1994
- 1 0 . "Considerations in Product Design for Safety: The Dependency Hypothesis", guest lecture in the course **Design for Safety in Machines**, Illinois Institute of Technology, Chicago, IL, September 13, 1995
- 1 1 . Seminar "Forklift Operator Restraint History/Development and Tipover Prevention", for the IRRST-Institut de recherche en santé et en sécurité du travail du Québec , Niles, IL., June 18, 1996

12. "Dangerous Safety Systems", guest lecture in the course **Design for Safety in Machines**, Illinois Institute of Technology, Chicago, IL, Sept. 26, 1996
13. Smith, R. Kevin, "Stability of Sit-Down Rider Counterbalanced Forklift Trucks", *Safety and Forensic Engineering Journal*, June 1999: 4-6
14. Smith, R. Kevin "Safety Considerations in the Implementation and Use of Forklift Truck Attachments", *Safety and Forensic Engineering Journal*, September 2000
15. Smith, R. Kevin "Lift Truck Safety Issues Update", *Safety and Forensic Engineering Journal*, July, 2002
16. Smith, R. Kevin "Case Study: Tipover of a Self-Propelled Elevating Work Platform", *Safety and Forensic Engineering Journal*, February, 2006
17. Smith, R. Kevin, Switalski, William G.; "Wind Loading Considerations in the Design of Aerial Work Platforms", *Safety and Forensic Engineering Journal*, March 2009

ADDITIONAL COURSEWORK

1. "Forensic Engineering, Part #1", Failure Damage & Analysis, Inc., November 2005
2. "Introduction to Metallurgical Failure Analysis", PDH Center, November 2005
3. "Safety and Health Requirements", based upon Army Corp. of Engineers Engineering Manual EM 385-1-1, PDH Center, November 2005
4. "Vehicle Accident Reconstruction Methods", Society of Automotive Engineers, August 24, 2007, IACET Provider #3713
- 5 . OSHA 30-Hour Construction Safety, Certificate ID: 5450_873980, Advance Online Solutions Institute, Houston, November 2013
- 6 . Powered Access License (PAL) certification, powered aerial lifts, Type 3a, 3b boom and scissor lifts. NES Rental IPAF training program, January 2015, Chicago, IL
- 7 . Aerial Work Platforms for Managers course, NES Rentals, January 2015, Chicago, IL
8. Basic Guide to Fall Protection in Industry, PDH Center, November 2015
9. Laws, Rules and Ethics for Indiana Professional Engineers, PDH Center, November 2015
10. The Engineer in the Courts, PDH Center, November 2015
11. "Ethical Issues in Forensic Engineering", PDH Center, October 2017
12. "Industrial Safety", PDH Center, October 2017
13. "Fall Protection in Industry", PDH Center, October 2017
14. OSHA Construction, Demolition and Cleanup Issues, PDH Center, October 2017
15. "Prevention Through Design LearnEx Course, American Society of Safety Engineers, October 2017

16. Engineering Ethics for Illinois Professional Engineers, CEDengineering.com, 11/19
17. Engineering Laws, Rules and Ethics for Indiana Professional Engineers, CEDengineering.com, 11/19
18. Electrical Safety, CEDengineering.com, 11/19
19. Accident Investigation, CEDengineering.com, 11/19
20. Fall Protection in Construction, CEDengineering.com, 11/19
21. Scaffold Use in the Construction Industry, CEDengineering.com, 11/19
22. Fluid Power: Hydraulic Power Units, CEDengineering.com, 7/20
23. Safety and Health Programs in Construction, CEDengineering.com, 11/21
24. Risk Management for Engineers, CEDengineering.com, 11/21
25. Personal Protective Equipment, CEDengineering.com, 11/21
26. Mechanical Power Transmission Fundamentals, CEDengineering.com, 11/21
27. Introduction to the Design of Mobile Hydraulic Systems, Part 1, CEDengineering.com, 11/21
28. Introduction to the Design of Mobile Hydraulic Systems, Part 2, CEDengineering.com, 11/21
29. Fluid Power (Part 2) – Hydraulic Power Units, CEDengineering.com,
30. Fluid Power (Part 3) – Hydraulic Components, CEDengineering.com, 11/21
31. Determining Negligence in Engineering Failures, CEDengineering.com, 11/21
32. Confined Space Entry, CEDengineering.com, 11/21
33. Indiana-Statutes, Rules, and Ethics for Professional Engineers, EZ-pdh.com, 7/22
34. Dozers and Rollers Basics and Safety; Engineering-PDH.com; November 2023
35. “Forensic Engineering”; Parts I through V; pdhonline.com; November 2023
36. “Front End Loaders Basics & Safety”; Engineering-PDH.com; November 2023
37. “Hoisting & Rigging Guidelines”; Engineering-PDH.com; November 2023
38. “Integrating Safety into the Design Process”, Engineering-PDH.com; November 2023
39. “OSHA Construction, Demolition, and Cleanup Safety Issues”, PDH Online, Nov 2023
40. “Walking-Working Surfaces”, PDH Online, Nov 2023
41. “CAT Wheel Loader Operation and Safety”; including operator manual study; CAT multiple video instruction, and CAT wheel loader hands-on training and operation.