

Jennifer Marrs MS, PE

Long View Consulting LLC
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Education & Achievements:

- Book Author: Machine Designers Reference, Industrial Press, New York, NY, 2011
- Professional Engineer: Licensed in NH, MA, VT
- MS Mechanical Engineering: Northeastern University, 1997
- BS Mechanical Engineering: Worcester Polytechnic Institute, 1992
- Registered US Patent Agent: Patent Bar Exam passed 2009
- NCEES Record Holder
- International Patent Holder (with four colleagues): (WIPO #WO 2004/010474)
 "Liquid Flow Controller And Precision Dispense Apparatus And System"

Areas of Experience:

- Machine, Fixture, Gauge, and Tool Design
- Machinery Safety: Detection Methods, Guarding, Noise Control, Access Control
- Machinery Risk Assessment and Mitigation
- Failure Modes and Effects Analysis
- Ergonomics and Human Factors
- Product Design: Consumer Products, Ink Jet Print Heads, Chemical Pumps, Liquid Dispense & Flow Control Systems
- Accident Investigation & Forensic Engineering: Automobile, Industrial, & Consumer Accidents, Forensic Analysis & Reporting
- Manufacturing Engineering: Assembly, Quality, Chemical, High Heat, High-Purity, and Test Processes for Consumer products, Electronics, Industrial Products
- Industrial Engineering: Material Handling, Flow Optimization, Workstation Design
- Technical Writing: Operator Manuals, Machinery Setup & Repair Manuals
- Pneumatic and Fluid System Design: O-rings, Seals, Gaskets, Materials, Flow Paths
- Clean Rooms and Other Industrial Environments
- Computer Aided Design, Drafting, Modeling, and Analysis: UG, NX, SW, AutoCAD
- Geometric Dimensioning & Tolerancing: ANSI & ISO standards
- US Patent Rules & Laws
- Aquariums & Aquarium Equipment: Design, Use, Maintenance, Failure Modes
- Off-Road Vehicle Modifications, Operation, Safety, & Vehicle Recovery

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Employment History:

- **7/2005 - Present Long View Consulting LLC**, Cornish, NH

Owner & Engineering Consultant: Provide mechanical engineering services, specializing in machine design, manufacturing, industrial equipment, material handling, test equipment, tool design, factory layouts, capacity analysis, machinery safety, and documentation. Also provide unbiased forensic engineering services.

Clients:

Keurig, Inc. (Owned by Green Mountain Coffee Roasters): Design, document, & implement a custom R&D assembly machine to make next generation coffee packages for Keurig brewers. Participate in design & specification of next generation OEM coffee packaging lines, and work with product development engineers to ensure manufacturability of new products.

Industrial Services & Engineering: Forensic engineering services

Reed Engineering Consultants, Inc.: Forensic engineering services

Causey Engineering LLC: Forensic engineering services

Gillette (Owned by Proctor and Gamble): Performed machine design, analysis, and documentation. Designed and documented many precision assembly stations on new product lines. Created complete technical specifications for new custom equipment to be outsourced. Designed retrofit kit for converting blade assembly equipment from one product line to another with minimum setup. Performed motion and loading analysis on legacy mechanisms, and generated optimized cam profiles.

Fujifilm Dimatix Inc.: Performed machine design, manufacturing, and industrial engineering activities. Designed inkjet print head test equipment with optimized thermal and flow properties. Designed manufacturing layouts for new processes, optimized existing process layouts to improve efficiency, coordinated with plant services to install utilities for new OEM equipment, and supervised moves of manufacturing lines.

Pompanette LLC: Performed machine concept design and industrial equipment specification for metal polishing operation.

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Employment History: *(Continued)*

- **8/2004 – 9/2007 TASC Technical Services**, Plaistow, NH

Consulting Engineer: Provided mechanical engineering services, specializing in machine design, manufacturing process design, machinery safety, risk analysis, and documentation. Primary client: The Gillette Company.

- **10/2002 – 8/2004 Fujifilm Dimatix Inc.**, Lebanon, NH

Mechanical Engineer, Manufacturing Engineering: Process Design & Implementation

Provided Ink Jet Print Head manufacturing process design and support. Processes included Silicon wafer manufacture, chemical treatment, heat treatment, soldering, electronics manufacturing, clean assembly, testing, and packaging. Also responsible for material handling, machine, fixture, workspace, and tool design.

- **11/2001 – 10/2002** Sabbatical

- **11/2000 – 11/2001 Mykrolis Corp.**, Bedford, MA

Mechanical Engineer, Liquids Dispense R&D Group: Product Design, R&D, and Manufacturing Process Design for High Precision Chemical Pumps, Flow Controllers, and Dispense Systems. Designed products for use in semiconductor manufacturing, chemical processes, optical disc manufacture, and high purity cleanroom environments. Responsible for product design, cost reduction, reliability testing, performance testing, life testing, characterization, and documentation.

- **6/1992 – 11/2000 The Gillette Company**, Boston, MA

Project Engineer, Engineering & Implementation Group: Designed and analyzed manufacturing machinery, equipment, and safeguards. Supervised build and startup of new equipment, performed functional testing, resolved issues found in debug, and oversaw equipment qualification runs. Wrote machinery documentation and operator manuals. Performed machinery risk assessment & mitigation. Other responsibilities included project management, product engineering, machinery control system design, design for noise control, design for ergonomics & safety, design of pneumatic and detection systems.

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Professional Development:

- General Industry OSHA Training: 28 hours (2009) Included:

<i>Machinery and Machine Guarding</i>	<i>Lockout/Tagout</i>
<i>Personal Protective Equipment</i>	<i>Ergonomics</i>
<i>Walking and Working Surfaces</i>	<i>Hazard Communication</i>
<i>Materials Handling and Storage</i>	<i>Confined Spaces</i>
<i>Means of Egress and Fire Protection</i>	<i>Electrical Safety</i>
<i>Lead, Asbestos, and Radiation Safety</i>	<i>Hazardous Materials</i>
<i>Welding, Cutting, and Brazing</i>	<i>Industrial Hygiene</i>
- General Topics in Forensic Engineering (2009)
- Evidence Gathering, Storing, Analyzing, Etc. (2009)
- General Topics in Forensic Engineering (2008)
- Accident Investigation 1 (2008)
- Accident Investigation 2 (2008)
- General Topics in Forensic Engineering (2007)
- Assessing Risk Factors in Machinery (2007)
- Identifying Risk Factors in Machinery (2006)
- Basic Overview of Corrosion Theory (2006)
- Lubricating Principles & Lubricating Oils (2006)
- Thermal Stress & Thermal Shock of Materials (2006)
- Applying Ethics & Leadership to Engineering (2006)
- Professional Liability (2006)
- Managing Project Cost, Revenue, and Profit (2006)
- Ergonomic Engineering, Design for Products, Design for Controls, Hand-Tool Design, Plant Flow (2002)
- Planning & Managing Projects (2001)
- Noise Control (2000)
- Spline Cams (2000)
- Advanced Geometric Dimensioning and Tolerancing (1996)
- Failure Mode & Effects Analysis (1995)
- Cam Design (1995)
- Basic Statistical Process Control (1995)

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Lectures, Publications, & Educational Engagements:

- Publication: Machine Designers Reference, Industrial Press, New York, NY, 2011. This book is a technical reference for working designers covering a variety of subjects.
- Educational Engagement: External Technical Review Board Examiner, Dartmouth College Thayer School of Engineering. Review student projects, provide feedback, and act as a professional engineering resource for the 6 month capstone design sequence. 2009, 2010, 2011
- Educational Engagement: External Review Board Examiner, Mechanical Engineering Major Qualifying Projects, Worcester Polytechnic Institute. Review student projects for both technical merit and presentation. 2005, 2006, 2010, 2011
- Lecture: "Benefits of Becoming a PE" Presented as part of the ASME Upper Valley Subsection event: "Professional Licensure Round Table Discussion and Q&A" at Dartmouth College, 5/5/2009
- Lecture: "Professional Engineering Licensure" Presented as part of Dartmouth College Thayer School of Engineering Senior Meeting, 10/9/2007
- Lecture: "Mechanical Engineering Careers and Professional Licensure" Marrs, J. and Gillis, C. Presented to the Worcester Polytechnic Institute ASME Student Chapter, Worcester, MA, 4/11/2007

(Below: Credited as Jennifer Wiley)

- Publication: "Bearing Forces as a Function of Mechanical Stiffness and Vibration Isolation in a Fourbar Linkage" Norton, R. L., Ault, H. K., Wiley, J., Parks, T., Calawa, R., and Wickstrand, M. *Symposium on Effects of Mechanical Stiffness and Vibration on Wear*, ASTM STP 1247, Raymond G. Bayer, ED., American Society for Testing and Materials, Philadelphia, 1995
- Publication & Lecture: "CAD and Mechanism Analysis of a Fourbar Linkage" Parks, T. J. Wiley, H. K. Ault, R. L. Norton. *International Aries User's Group Meeting*, May 2-5 1992, Lowell, Mass., pp. 237 – 260

Affiliations:

- ASME: American Society of Mechanical Engineers
Officer: Executive Committee Program Chair of Upper Valley Subsection
2009, 2010, 2011
- NAFE: National Academy of Forensic Engineers (*Correspondent*)
- NSPE: National Society of Professional Engineers
- NHSPE: New Hampshire Society of Professional Engineers
- SME: Society of Manufacturing Engineers