**Ray Williamson**

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**Laser/Precision Optics Engineer,** with over 30 years of experience in developing and implementing process-engineering initiatives in support of key business strategies. Possess a unique ability to determine a client’s engineering requirements, propose an optimal approach matching the company’s capabilities, and convey complex engineering issues to technicians in an understandable manner. Technical background includes: optical physics, manufacturing and metrology methods, custom applications engineering, polarization, lens design, system design, quality assurance procedures/management, and technical sales support. *Created and implemented an entire quality assurance system consistent with established standards (including ISO 9001), encompassing traceable calibration, documented methods, and continuous improvement while assuring conformance to customer requirements*. Additional strengths include:

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| * Staff/technician training and development
 | * Physical and optical metrology methods
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| * Forming and leveraging customer alliances
 | * Ability to grasp and utilize new technologies
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| * Leading MRB and process engineering teams
 | * Process analysis, simplification and optimization
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| * Quantitative and qualitative analysis and modeling
 | * Technical policies, methods, and records documentation
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* Entrusted by senior management with writing, implementing and managing all aspects of a quality system that achieved the rating “best ever seen for a company of this size” by Agilent.
* Wrote and taught a comprehensive 6-month apprenticeship program for opticians, designed to raise the skill level of 40 new-hires to the skill level of 5-10 year veterans.
* Successfully trained 160 employees in shop math skills, quality methods, and team problem-solving techniques, resulting in a documented 50% price reduction for non-conformance.
* Developed and managed an ongoing document-control system encompassing over 50,000 prints. The group maintained a *zero* released-error rate.
* Designed and built a technician-friendly instrument for measuring free spectral range of etalons to much less than 1 ppm; and a technician-friendly instrument for measuring retardance of waveplates to better than 50 ppm.
* Invented an interferometer configuration designed to predict infrared transmitted wavefront of thin, opaque plates using simultaneous visible light reflections from opposite sides.
* Created and implemented a batch cleaning system capable of preparing 2,000 laser mirrors for thin-film coating in a single run.
* Designed machine and developed deterministic process for polishing 457 mm Φ NaCl windows to λ/10.
* Composed and formatted all text for general catalog that subsequently won an Excellence Award from the Society for Technical Communication.
* Achieved proficiency in hands-on experience with full complement of shop machinery and M&TI, creating optics ranging from micro to massive, plano to high-order aspheric, UV to IR, as well as spanning telecom to high power. Materials include a variety of crystals, metals and glasses.
* Conceived in the late 1980’s, a gas-cooled high-power laser output coupler that subsequently won an “R&D100 award.” This award from ***R&D Magazine*** honors the most outstanding new technologies, processes, materials, and software with commercial potential.

**Ray Williamson Page Two**

##### **PROFESSIONAL EXPERIENCE**

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| **Ray Williamson Consulting, New Port Richey, Florida** | **September 2002 to Present** |

Consultant – Practice includes technical writing, practical troubleshooting, hands-on optical shop and lab work, instrument development, customer interface, corporate training, and optical and optomechanical design. Clients include Northrop-Grumman, Heraeus Optics, VLOC, Tower Optics, and others.

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| **VLOC, SUBSIDIARY OF II-VI INC., New Port Richey, Florida** | **1992 to September 2002** |

Engineering Manager – Scope of duties includes managing and growing the quality assurance department, while simultaneously writing and administering all aspects of a quality system including documented testing methods. Developed telecom and polarization optics manufacturing and metrology methods. Acted as the prime customer technical interface for both design and quality. Created and taught training programs for manufacturing, quality and management. Facilitated cross-functional teams including engineers, salespeople, and technicians.

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| **LASER POWER OPTICS, San Diego, California** | **1983 to 1992** |

Engineering Manager – Managed an engineering department responsible for process engineering, document creation/control, and tooling design. Designed and performed null tests to verify aspheric diamond-turned infrared optics. Conceived and implemented one of the first barcode-based shop floor control systems. Designed numerous optomechanical assemblies.

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| **COHERENT, INC., Auburn, California** | **1979 to 1983** |

Process Engineer – Primary duties focused on creating and instructing apprentice training programs. Developed high- speed and precision optical fabrication and cleaning methods and tooling. Built custom interferometer. Wrote and maintained all manufacturing instructions.

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| **LOS ALAMOS NATIONAL LABORATORIES, Los Alamos, New Mexico** | **1976 to 1979** |

Staff Member, Laser Fusion Group – Responsible for designing, equipping and managing the optical characterization laboratory. Designed machinery and managed the project to develop methods for refurbishing NaCl optics. Performed tests on pressurized optics and motorized mounts.

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| **SPECTRA-PHYSICS, INC., Mountain View, California** | **1972 to 1976** |

Process Engineer, Optics Group – Created tooling and methods including batch cleaning system and tumble-beveling. Fabricated prototype optics. Manufacturing engineer on first electronic label reader project.

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| **OPTICAL SCIENCES CENTER, UNIVERSITY OF ARIZONA, Tucson, Arizona** | **1971 to 1972** |

Assistant Optician, Mirror Lab – Generated, ground, polished and tested massive optics including 101” Cerro Tololo primary and 72” Multiple Mirror Telescope primaries.

##### **EDUCATION & PROFESSIONAL DEVELOPMENT**

B.S., Physics (Optics Concentration), San Diego State University, San Diego, California

**Numerous short courses including**: Elementary and Intermediate Optical Design, Understanding Optical Aberrations, Optical System Layout, Zemax I and II, DWDM Systems and Components, Optomechanical Design, Crosby Quality College, Crosby Master Facilitator Training, Lean Manufacturing, Polarization, Thin Films, Structural and Optical Adhesives, ISO Quality Systems Implementation, ISO 10110 Optical Component Specifications.

**Publications include**: “Modular Spot Tools” in *SPIE Proceedings*

“Batch Cleaning and Drying of Optics Using a Spin Dryer” in *OSA Optical Fabrication and Testing Workshop*

“When Two Waves Interfere, One Fringe Equals One Wave OPD, Always” in *SPIE Proceedings*

“Inexpensive Method for Evaluating Spot Tools” in *Selected SPIE Papers On CD-ROM*

“When Snow Melts, Where Does the White Go?” in *Light Touch, Optics and Photonics News*

“Precise Method for Determining free Spectral Range of Telecom Etalons” in *SPIE Proceedings*

“Cooperative Educational Project for Optical Technicians Utilizing Amateur Telescope Making” in *SPIE Proceedings*

“Novel Interferometer” in *SPIE Proceedings*