ALPINE
ENGINEERING & DESIGN, INC.

CURRICULUM VITAE

ROBERT A. IRION

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PROFILE

Mechanical engineering and product development expert in Medical Device & Medical Equipment, Oil & Gas, Consumer Product, and Product Packaging industries. Designed for and tested to standards and regulations, such as IEC, UL, OSHA, and ASTM. Selected for and completed General Electric's intensive leadership program. Led new product development, design optimization, cost reduction, prototyping, testing, verification and validation projects on many products that resulted in successful production runs. Provided expert witness support on various Intellectual Property and Personal Injury suits. Certified as an Associate Safety Professional, which results in improved engineering designs and better informed expert opinions. Experienced in teaching and breaking down complex subjects to peers and students..

EXPERIENCE

Oil and Gas - Drill String Tool Development

- Designed, built, and tested novel down-hole drill string tools in an extreme fluid dynamics, vibration, and erosion/wear environment
- Machined and fabricated the new products in the in-house machine shop, which better informed future designs
- Oil and Gas design and testing projects:
  - Designed a down-hole drilling "crawler"—a device that provides more weight on bit using the pressure differential across the tool to actuate
  - Designed a down-hole drilling actuator valve, using electromechanical forces to open and close the synthetic diamond valve—used for toggling down-line tools
  - Designed a down-hole filter using synthetic diamond as the filtering mechanism, which allows the use of drilling mud to drive or actuate debris-sensitive tools
  - Planned various test setups and layouts for above designs using high pressure and high flow pumps
  - Measured the impact energy that the synthetic diamond bits could withstand via drop tests
  - Designed an air-actuated impact test tool to determine the number of impacts needed to induce part failure

EXPERIENCE CONT'D

Medical Equipment & Device - MRI System + Autoinjectors – Product Development

- Managed several R&D projects of the MRI gradient coil team—from napkin design to full-production
- Designed, built, and tested electromechanical, fluid, thermal, and mechanical systems in a high vibration, electrical energy, and thermal environment
- Experienced in designing to and managing regulatory requirements; i.e. UL and IEC. Designing and testing to these regulations produced MR systems that are deemed safe to use by the FDA
- Medical design and testing projects:
  - Designed and launched a novel gradient coil design for a new MRI system – SIGNA Premier – that provides better, higher resolution magnetic resonance scans
  - Designed an industry-first stainless steel additive manufactured manifold for use on MRI systems gradient coils that improved reliability and generated annual cost savings of $1.2MM
  - Planned, ordered, and investigated cross-section cuts of defective/failed MR subsystems to determine the root-cause of failure and design improvement opportunities
  - Performed MRI gradient coil subsystem testing and measurements: Resistance, mutual capacitance, impedance, flow rate, pressure decay leak, stack up and size measurements
  - Performed verification and validation of gradient coil subsystem once integrated into MRI system: Gradient coil strength, slew rate, linearity, and uniformity of magnetic field. Acoustic and thermal testing to regulatory and internal standards. Imaging resolution measurements
  - Reverse engineered and modeled autoinjector devices
  - Designed and prototyped neonatal ventilator for use in third-world medical facilities

Consumer Product and Miscellaneous Design

- Consumer Product & Misc design and testing projects:
  - Designed smart, motorized, all-in-one gym cable machine subsystems
  - Designed tongue and groove EVA playsets for children ages 3+ in addition to the product packaging and end-cap displays
  - Developed new sourcing paths for the playsets and packaging
  - Explored alternative materials study for downhill snow skis
  - Prototyped lower limb prosthetics using bamboo and common miscellaneous materials

CERTIFICATIONS

- Engineer in Training (EIT) - Mechanical
  - Certification Number: NCEES 14-064-77
- Certified Associate Safety Professional (ASP)
  - Certification Number: ASP-39753
- IVES Forklift Operator Certified
- Lead Leader - Six Sigma
- Green Belt - Six Sigma

PATENTS

Prior to employment at Alpine Engineering & Design, became familiar with the patent industry. Key inventor on one US patent – US 11,774,529 "Gradient cooling manifold assembly having additively manufactured manifolds" – and several trade secrets in the medical equipment industry.

Since being employed at Alpine Engineering & Design, gained experience in mechanical systems, patent litigation, and patent consulting. Provided expert support including: invalidity opinions, reports, claim charts, prior art searching.

EDUCATION

Bachelors of Science, Brigham Young University
Mechanical Engineering (2013)