

Ronald Joe Schoolcraft

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Educational Background

June 1988

Bachelor of Science in Mechanical Engineering
GMI Engineering & Management Institute, Flint, Michigan
Formerly General Motors Institute

Engineering Experience

Schoolcraft Power Train

Martinsville, IN

6/99 – Present

Proprietor, Schoolcraft Power Train Engineering Services

- Providing engineering services and expertise to the power transmission industry with special expertise in gear design and manufacturing and seal system design.
- Developing Windows[®]-based software for power transmission systems design and analysis (gears, bearings, clutches, splines, etc.).

Caterpillar, Inc. Transmission Business Unit

East Peoria, IL

9/98 – 6/99

Project Engineer D5M/D6M Track-Type Tractor Transmission

- Redesigned steering clutches to integrate with transmission module.
- Expert participant on TBU Lip Seal Problem Team. Assigned to review all new Lip Seal System designs within TBU.
- Assigned to represent TBU on Caterpillar's corporate lip seal team.

Allison Engine Company Rolls Royce Aerospace Group

Indianapolis, IN

Formerly Allison Gas Turbine Division, General Motors Corporation

9/91 – 9/98

Model 250 (Helicopter Engine) Product Design Engineer

New product development – advanced derivatives of production models

- Model 250-C30R/2: Supercritical shaft system for OH58D Kiowa Warrior
 1. Led design effort for layout, analysis, detail design and hardware fabrication.
 2. Coordinated supercritical shaft test rig design and oversaw testing.
 3. Supported mechanics for prototype builds and assisted with test program.
- Model 250-C40B: 715 hp (10% growth) rating for Bell Model 430 Helicopter.
 1. Redesigned power gears to increase torque capacity and hydraulic torque meter capacity. Analytically optimized tooth modifications for mesh load distribution.
 2. Defined concept of alternate electronic torque meter system.
 3. Designed, developed and released to production a non-intrusive self-closing valve (U.S. patent 5,782,141) for magnetic chip detectors.

Production support and product improvement

- Group leader of cross-functional team to integrate design and manufacturing engineering of mechanical components (especially gears).
 1. Identified routing changes to reduce quench distortion of thin webbed gears.
 2. Compiled database for case depth and hardness gradient in tooth root.

3. Analyzed involute and lead variations for acceptability.
 4. Developed methods to salvage grind unacceptable gears based on metallurgical database and statistical analysis.
- Design responsibility for all housings, gears, bearings, seals, shafting, splines, etc.
 - Redesigned pinion roller bearings for improved reliability.
 - Implemented improved lip seal journals to eliminate oil leaks.
 1. Planned and executed research test program with in-house rig.
 2. Planned and executed field test program on selected customer aircraft.
 3. Developed new engineering specifications and requirements for journals.
 4. Assisted with manufacturing process development to meet requirements.
 - Developed repair procedures for static and rotating non-conforming hardware.

6/88 – 9/91

Mechanical Technology Development Engineer

Advanced technology development activities

- Gear materials and surface hardening research:
 1. Developed foursquare gear fatigue test machine and directed test program comparing heat treat and material combinations.
 2. Developed highly crowned test gears to concentrate Hertzian stresses for accelerated testing while maintaining acceptable bending stresses.
 3. Designed test gears for single tooth bending fatigue testing.
- Lightweight gear materials research: Program manager of Allison effort on Army SBIR program for lightweight gearshafts.
 1. Wrote technical proposal to prime contractor.
 2. Designed lightweight multi-metal gearshaft for Model 250-B17F engine.
 3. Wrote manufacturing process for part fabrication
 4. Prepared test plan to demonstrate the technology for aircraft engine use.
 5. Oversaw successful demonstration test of prototype piece on back-to-back rig.

Advanced design activities

- Project leader for preliminary design and concept definition of advanced vertical lift system for supersonic STOVL strike fighter (Air Force/Navy JSF)
 1. Preliminary design and parametric scaling of advanced wet and dry disk clutch systems for STOVL strike fighter.
 2. Preliminary mechanical design of advanced hollow blade lift fans.
 3. Conceptual design of 2D thrust vectoring nozzle.
 4. Managed lift system report and proposal effort.

Computer programming activities

- Developed knowledge-based preliminary design software for multiple disk clutches and counterrotating propfan gearboxes.
- Developed preliminary heat transfer analysis code for clutch disks.
- Maintained and improved in-house gear analysis software.

6/83 – 6/88

GMI Cooperative Experience

The GMI cooperative program included nine semesters consisting of twelve weeks of classes at GMI and twelve weeks work experience at Allison. The tenth semester was for undergraduate thesis preparation at Allison.

- GMI thesis: Preliminary design and FEA of single helical planet gear with ribbed-cup tapered roller bearings for 13,000 hp. Model 578-DX engine.