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 PowerTrain, Inc.
Martinsville, IN

6/99 – Present **President, Schoolcraft PowerTrain, Inc.**

- Providing engineering services and expertise to the power transmission industry with special expertise in gear design and manufacturing and seal system design.
  Expert witness testimony, design engineering support, manufacturing engineering support, problem troubleshooting, Training.
- Customers served: Caterpillar, Rolls-Royce, Laibe Corporation, Southwest Research Institute, MTSI, John Deere, Axicon Technologies, Productive Resources, Slone Gear International, among others.
  1. Caterpillar: Lip seal systems expert consultant
  2. Rolls Royce: Multiple projects on 601, T56/501, 250 among others
  3. Laibe Corporation: Expert witness testimony for transfer case failures
  4. MTSI: a) Solved vibration/alignment problem for Korean Navy patrol boats; b) Corrective redesign of starter to clutch interface for GE LM500 and LM2500
  5. John Deere: Designed multidisc brake system for MW35-55 tractors
  6. Slone Gear: Designed 4-square spline test rig
     a. Test specimen operates at up to 900 hp and 15,000 rpm
     b. Hydraulic torque applier allows infinite variability of torque 0 – 1570 lb-in
     c. Variable motor allows speeds 0 – 15000 rpm
     d. Variable misalignment angle up to .25°
     e. Variable test spline lubrication flow
  7. Southwest Research Institute
     a. YTO - Conceptual design of FEADS/Timing train for 140 kW, 4-cylinder Diesel
     b. Achates Power
        i. Designed timing gear train for opposed piston 3-cylinder, 6-piston 10L, 2-stroke Diesel engine
        ii. Preliminary and final design including tooth microgeometry modifications
  8. Circular Wave Drive through Slone Gear: Designing small, high ratio gearbox for the robotics industry
  9. LEKTRO, Inc.: Expert witness support for failing planetary wheel drive units

Productive Resources
Indianapolis, IN

10/11 – 10/12 **Senior Engineer**

- Provided technical expertise on multiple projects.

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
- Model 250-C40B: 715 hp (10% growth) rating for Bell Model 430 Helicopter.
  1. Redesigned power gears to increase torque capacity and hydraulic torquemeter capacity. Analytically optimized tooth modifications for mesh load distribution.
  2. Designed, developed and released to production a non-intrusive self-closing valve (U.S. patent 5,782,141) for magnetic chip detectors.
- Model 250-C20R/9: Major design changes to gearbox to incorporate FADEC

Production support and product improvement

- Group leader of cross-functional team to integrate design and manufacturing engineering of mechanical components (especially gears).
- 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.

6/88 – 9/91 **Mechanical Technology Development Engineer**

Advanced technology development activities

- Gear materials and surface hardening research:
- Lightweight gear materials research: Program manager of Allison effort on Army SBIR program for lightweight gearshafts.

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 now the F35B)
  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 (during entire time of employment).

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. The thesis project was the preliminary design of a single helical planet gear and tapered roller planet bearing for the 578-DX gearbox.