

EXPERIENCE**BRG MACHINERY CONSULTING, LLC**, Charlottesville, VA*Machinery Consultant*, October 2010 - Present

Work with a group of highly qualified machinery specialists in providing a full range of rotating machinery management services. Actively involved in providing expertise in the following areas:

- Vibration analysis
- Field measurements and machinery health monitoring
- Experimental modal analysis (EMA) and operation deflection shape measurements (ODS)
- Reliability programs and machinery troubleshooting
- Rotordynamic audits
- Development of machinery analysis software tools
- Training on vibrations, rotordynamics, fluid film bearings and instrumentation

E. I. du Pont de Nemours & Company, Wilmington, DE*Consultant*, January 2001 – October 2010

Providing technical assistance to DuPont's strategic business units, became one of the company's recognized experts in the areas of machinery troubleshooting, vibration analysis, and advanced field measurements. The technical support included modal and stress analysis, measurement of operating deflection shapes, root-cause diagnosis of failures, and modeling of rotating machines and other dynamic systems. Applied advanced analysis software and instrumentation to solve field problems for a wide range of process machinery and specialized equipment including reciprocating pumps and hyper-compressors (30,000 psi discharge pressure), centrifugal pumps and compressors, steam turbines, fans, centrifugal dispersers, centrifuges, compactors, polishers, ovens, film slitters, film and web handling systems, electric motors and winders. The kinds of problems analyzed and resolved included resonances in the speed range, out of round rolls, speed variations, broken plungers, fatigue of inlet and discharge valves, improper foundations, instability, improper pipe supports, blade resonances, unbalance problems, as well as temperature related casing distortions. Trained younger engineers in vibration analyses, experimental modal analysis and machinery troubleshooting.

ROTATING MACHINERY & CONTROLS (ROMAC) LABORATORIES, University of Virginia*Research Scientist*, December 1998 – January 2001

Provided technical support for the students, faculty and industry member of ROMAC on the use of ROMAC engineering programs. Many of these engineering programs are recognized as industry standards and are used worldwide in the analysis of rotating machinery. This technical support included modifying and upgrading existing codes as well as developing and validating new ones. Led research on the dynamics of flexible bearing pedestals and the application of modern control tools to rotordynamics.

Lab Engineer, September 1996 – December 1998, *Research Assistant*, September 1992 – September 1996

Some of the responsibilities included designing, building and testing a new experimental rig to test the influence of support flexibility on the performance of rotating machinery, instrumentation of a flexible rotor rig, modification of bearing design codes, modification of computer codes to calculate the stability of rotating machinery, testing of different bearing types for a flexible rotor rig, development and test of new balancing techniques using modern instrumentation, and modal testing of rotors and supports in rotating machinery.

UNIVERSIDAD SIMON BOLIVAR, Sartenejas, Venezuela*Head of the Dynamics of Machinery Laboratory*, Department of Mechanical Engineering, September 1991 - August 1992*Instructor*, Department of Mechanical Engineering, September 1990 - August 1992

The main teaching areas were dynamics of machinery and mechanisms, instrumentation and kinematics.

EDUCATION

UNIVERSITY OF VIRGINIA, Charlottesville, VA

Doctor of Philosophy, Mechanical and Aerospace Engineering, January 1999

Dissertation: Using transfer functions to model flexible supports and casings in rotating machinery.

UNIVERSIDAD SIMON BOLIVAR, Sartenejas, Venezuela

Specialization in Rotating Machinery, (Especialización en Máquinas Rotativas). January 1993

Bachelor of Science, Mechanical Engineering, October 1990

PROFESSIONAL ACTIVITIES

Member, American Society of Mechanical Engineers

Reviewer, ASME Turbo Expo

Reviewer, *Journal of Engineering for Gas Turbines and Power* and *Journal of Vibrations and Acoustics*

CONFERENCE PAPERS AND PRESENTATIONS

- “High motor vibration on screw compressor linked to natural frequency excitation,” Case Study. Turbomachinery Symposium 2010, October 4-7, 2010, Houston, Texas, with MC Taylor.
- “Repeated failures on 2nd stage impeller linked to blade natural frequency excitation,” Case Study. Turbomachinery Symposium 2009, September 14-17, 2009, Houston, Texas, with JD Elmore, M Skalski and RA Houston
- “Intermittent Spikes on Vibration and Motor Current Caused by Water Carry Over on the 3rd Stage of a Centrifugal Compressor,” Case Study. Turbomachinery Symposium 2009, September 14-17, 2009, Houston, Texas, with JC Moore, B Addison, SR Locke and RJ Eizember.
- “Pump baseplate resonance responsible for large piping vibration and component failures,” Case Study. International Pump Symposium 2008, April 21-24, 2008, Houston, Texas.
- “Transfer Function Representation of Flexible Supports and Casings of Rotating Machinery”, Proceedings of the 17th International Modal Analysis Conference, Orlando, Florida, USA, February 1999, with LE Barrett.
- “Representing Flexible Supports by Polynomial Transfer Functions”, Paper 98-GT-27, 43rd ASME Gas Turbine and Aeroengine Congress, Exposition and Users Symposium, Stockholm, Sweden, June 1998, with LE Barrett.
- “Comparison Between Calculated and Measured Free-Free Modes for a Flexible Rotor”, Paper 98-GT-51, 43rd ASME Gas Turbine and Aeroengine Congress, Exposition and Users Symposium, Stockholm, Sweden, June 1998, with LE Barrett.

JOURNAL PUBLICATIONS

- “Model Identification in a Magnetically Supported Rotor,” *ASME Journal of Engineering for Gas Turbine and Power*, Vol.125, pp 149-155, January 2003, with EH Maslen, HJ Ahn and DC Han.
- “Flexible Bearing Supports, Using Experimental Data,” *ASME Journal of Engineering for Gas Turbine and Power*, Vol. 124, pp. 369-374, April 2002, with LE Barrett and RD Flack.
- “Reconciliation of Rotordynamic Models with Experimental Data,” *ASME Journal of Engineering for Gas Turbine and Power*, Vol. 124, pp. 351-356, April 2002, with EH Maslen and CK Sortore.
- “Synchronous Response Estimation in Rotating Machinery,” *ASME Journal of Engineering for Gas Turbine and Power*, Vol. 124, pp. 357-362, April 2002, with EH Maslen and CK Sortore.
- “A Flexible Rotor on Flexible Bearing Supports. Stability and Unbalance Response,” *ASME Journal of Vibrations and Acoustics*, Vol. 123, pp 137-144, April 2001, with LE Barrett and RD Flack.
- “Including the Effects of Flexible Bearing Supports in Rotating Machinery,” *International Journal of Rotating Machinery*, Vol. 7, No. 4, pp. 223-236, 2001, with LE Barrett and RD Flack.
- “Modeling of Tilting-Pad Journal Bearings with Transfer Functions”, *International Journal of Rotating Machinery*, Vol. 7, No. 1, pp 1-10, 2001, with LE Barrett.