

A close-up, artistic photograph of a turbine engine component, likely a compressor or turbine section. The image features several curved, metallic blades in shades of red and silver, arranged in a radial pattern. The lighting is dramatic, highlighting the smooth, polished surfaces and the intricate geometry of the blades. The background is dark, making the metallic parts stand out.

TRC

TURBOMACHINERY RESEARCH CONSORTIUM



WHAT IS THE TURBOMACHINERY RESEARCH CONSORTIUM?

The Turbomachinery Research Consortium (TRC) is a unique organization of major turbomachinery developers and users who have joined with the Turbomachinery Laboratory, a center of the Texas A&M Engineering Experiment Station, part of The Texas A&M University System, to find answers to important questions about turbomachinery performance and reliability through cutting-edge research. More than 40 industrial firms provide annual grants of \$25,000 to support a broad range of member-selected research projects. At any given time, fifteen to twenty graduate students are being supported by the TRC.



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OUR PURPOSE

Turbomachinery developers and users are driven to improve performance and efficiency. While specific research goals differ among users and manufacturers of turbomachinery, there is a large overlap of interests. The TRC was organized to expedite laboratory research into addressing performance and reliability problems of turbomachinery, and to enhance the continuing development of a comprehensive educational program at Texas A&M University. Since its beginning in 1981, the TRC has

utilized its strong foundation of state-of-the-art facilities, computer codes and highly-qualified research staff to solve current practical problems.

TRC membership generally consists of high-technology manufacturers of turbomachinery and sophisticated users of high-performance commercial turbomachinery, due to a history of externally-funded research programs and Texas A&M's proximity to the Gulf Coast petrochemical industry.

TRC research goals emphasize test validation of analysis and computational results, largely driven by the industrial experience and expertise of the Turbo Lab faculty. TRC accomplishments include the development of:

- Computational tools to aid in the design process
- Specialized test rigs
- Resolutions for current turbomachinery problems
- Industry-ready engineering graduates



MEMBERSHIP BENEFITS

EXCLUSIVE PROJECT SELECTION

TRC research projects are selected by member companies during the annual Spring TRC Planning Meeting. Turbo Lab faculty and students whose projects are selected begin their research in September.

XLTRC² SOFTWARE

TRC members have access to XLTRC², a suite of high-speed, experimentally verified and user-friendly codes for executing a complete lateral and torsional rotordynamic analysis of rotating machinery, including pumps, compressors and turbines. XLTRC² is bundled with 25 or more examples of rotordynamic analysis, including rotors for compressors, pumps and gas turbines. Each model features distinctive bearing/seal support conditions and displays unique characteristics of rotordynamic behavior.

XLTRC² runs on Windows Vista and Win7 and Microsoft Excel 2007 and 2010. Extensive help files are provided for the base and support-library codes. SI or US units can be used interchangeably.

CUTTING-EDGE INDUSTRY KNOWLEDGE & RESEARCH

TRC members have access to Texas A&M University faculty expertise across a broad spectrum of turbomachinery problem areas. Members are privy to a continuing series of reports and computer programs on all TRC research activities. Members are also encouraged to hire the highly-qualified, industry-ready graduate and undergraduate students who conduct research in the Turbo Lab.

STATE-OF-THE-ART RESEARCH FACILITY

TRC members have access to laboratory facilities for conducting specialized experimental research.

The Turbo Lab is located on George Bush Drive in College Station, Texas, adjacent to Texas A&M University's main campus. The 37,000 square foot high-bay facility is equipped with 12 top-of-the-line vibration damped test cells and a variety of compressors that provide air for test rigs with capacities ranging from 4000 standard cubic feet per minute (scfm) at 120 pounds per square inch gauge (psig) to 1350 scfm at 300 psig. An adjacent reciprocating compressor rig features connections for high-pressure air up to 1200 psig. Each test cell has connection to power motors to 300 KW.

For more information on TRC
or XLTRC², visit
turbolab.tamu.edu or
email trc@turbo-lab.tamu.edu.

2017-18 RESEARCH PROJECTS

1. Computational Model for Tilting Pad Journal Bearings
2. CFD Based Impeller Rotordynamic Force Coefficients
3. Pressing Needs for Seals/Gas Labyrinth Seals
4. Novel Carbon-Graphite Gas Bearings for Turbomachinery
5. Software Development for Morton Effect Prediction (Thermally Induced Rotor Instability)
6. Experiment Investigation of Morton Effect (Thermally Induced Rotor Instability)
7. Software for Torsional Vibration of Machinery Trains with Variable with VFD
8. Wet (Bubbly) Seals: Identification of Force Coefficients
9. Rotordynamics Software with Nonlinear Magnetic Bearings, Flexible Rotor and Flexible Foundation Effects
10. Flow Optimization Design Tool for Impellers and Seals Rotordynamics
11. Drag Reducing Textured Surface Journal and Thrust Bearing
12. Development of a New Test Rig to Examine Mechanical Seal Failures due to Lateral Vibration and Pressure Fluctuations
13. CFD Analysis of Wet Gas Pocket Damper Seal and Validation Against Test Data
14. Gear Box and Coupling Guard Heating and Windage Losses
15. Solid Modeler Implemented Rotordynamics
16. Dynamic Characterization of Fully Partitioned Damper Seals
17. Pad Bearing Coating

READY TO JOIN? CONTACT US TODAY.

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2017-18 MEMBER COMPANIES

- Atlas Copco Comptec
- BHEL Hyderabad
- The Chemours Company
- Chevron Texaco Corporation
- ConocoPhillips
- Danfoss Turbocor
- Dresser-Rand Business, part of Siemens Power and Gas Division
- Elliott Company
- ExxonMobil Research and Engineering
- GE Oil & Gas-Nuovo Pignone S.p.A.
- Hanwha Techwin
- Hess Corporation
- Hitachi
- Honeywell
- Hunan SUND Co., Ltd.
- Ingersoll Rand – Engineered Centrifugal Compression
- John Crane
- Kawasaki Heavy Industries
- Keyyang Precision
- Kobe Steel Ltd.
- Koch Industries
- MAN Turbo SE
- Mitsubishi Heavy Industries
- New Way Air Bearings
- PETROBRAS
- Pratt & Whitney
- Praxair
- Safran Aircraft Engines
- Schlumberger Oilfield Pte. Ltd.
- Shell Global Solutions
- Shenyang Blower Works Group
- Solar Turbines Inc.
- Southwest Research Institute
- Statoil
- Sulzer
- Torishima Pumps
- Voith Turbo GmbH & Co. KG
- Waukesha Bearings

