

# Advanced Reliability Technical Services

AREVA has the unique capabilities and advanced tools required to solve today's difficult engineering problems. The Reliability Improvement staff has experience analyzing all types of mechanical components including turbo machinery such as pumps, compressors, gas turbines, steam turbines, industrial fans and diesel engines. We have been applying advanced technologies to equipment problems in power generation and other industries for many years. Whether you are in the design stage, having problems or assessing operability of nuclear power plant rotating equipment under postulated LOCA conditions, we can help using advanced dynamics analyses coupled with field testing.

We keep ahead of the competition by participating in R&D activities such as smart components and equipment development for future nuclear power plants.

Our services are most often used to support:

- Troubleshooting
- Operability assessment
- Predictive Maintenance (PdM) programs
- Reliability improvement
- Preventive Maintenance Optimization (PMO)
- Life cycle management
- Power uprate
- Life extension
- PdM and PMO training courses and workshops

Technologies used are based on engineering principles and industry best practices such as:

- Rotor-dynamics modeling and analysis including lateral, torsional and axial
- Bearing evaluations for all types of bearings including fluid-film bearings, anti-friction bearings and magnetic bearings
- Finite element modeling and analysis
- Modal analysis and operating deflection shape
- Vibration/strain measurements and analysis
- Standard predictive maintenance technologies
- Predictive maintenance program implementation and execution



*Vibration surveys utilize microprocessor-based computer systems, which provide a fingerprint of the operating condition of machinery.*

## Features and Benefits

- Ensured continuity throughout your PdM program
- Improved equipment reliability
- Prioritization of maintenance upgrades
- Root cause analysis
- Solutions – before the problems start
- On-the-job training

## Vibration Analysis

A periodic vibration survey is the foundation of any PdM program. Ongoing trend data and analysis leads to important information about the mechanical condition of bearings, gears, pumps, compressors and fans. Many machine faults such as misalignment, imbalance, looseness and worn couplings are easily detected and corrected using vibration analysis resulting in less costly repairs and increased plant availability.

## Thermography Services

Our thermography services enhance equipment reliability and reduce potential safety problems. Infrared thermographic imaging identifies and classifies problems by the amount of heat generated by a component. We have conducted thermography testing for commercial and industrial facilities using infrared images to detect and measure overheating in mechanical and electrical equipment as well as determining building heat loss. Thermography provides an excellent tool to inspect electrical systems for faults such as insulation degradation, poor connections and malfunctioning transformers and breakers. The technology can also be applied to process and mechanical systems such as steam traps, valves, piping systems, tanks, motors and bearings.

## Electrical Motor Testing

Electric motors are the workhorses of the industry, driving everything from large water pumps to HVAC blowers. To help companies minimize operating and maintenance expenses associated with motors, we offer an integrated approach to motor diagnostic testing by combining off-line testing and on-line monitoring techniques. This procedure provides accurate assessments of motor conditions and can easily identify equipment repair and replacement needs.

**AREVA Inc. Corporate Headquarters**  
One Bethesda Center  
4800 Hampden Lane, Suite 1100  
Bethesda, MD 20814

For more information,  
contact your VP, Key Accounts:  
Tel: 434 832 4727 – Fax: 434 832 3840  
[regional.manager@areva.com](mailto:regional.manager@areva.com)



## Corrective Maintenance Services

Our corrective maintenance services include dynamic balancing, laser alignment services, structural modifications and technical training by certified instructors. Our corrective maintenance team has the expertise to resolve plant problems quickly. This expertise, combined with a vast range of engineering and technical support, ensures that you receive the highest quality of service and the greatest return on your investment.

## Training Programs

Thinking of starting your own in-house PdM program? Let us bring solutions to you. Our on-the-job training combines traditional classroom instruction with real-world field training at your facility. We can tailor our program to meet your needs and conditions to ensure that you get exactly what you need to run a world-class program.

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