Rotating Equipment Maintenance and Troubleshooting Training Course

23 - 27 Nov 2026

Milan

5900 € (Per Person)

Ref: #OG9083_100139

Course Introduction / Overview:

This comprehensive training course provides an in-depth exploration of rotating equipment engineering, focusing on practical maintenance strategies and effective troubleshooting techniques. In modern industrial settings, the reliability of machinery such as pumps, compressors, and turbines is paramount to operational success and safety. This program is designed to equip participants with the fundamental knowledge and advanced skills required to manage these critical assets throughout their lifecycle. Drawing upon established principles and industry best practices, the curriculum delves into machinery components, lubrication, alignment, condition monitoring, and failure analysis. We will reference the foundational work of experts like Heinz P. Bloch, whose insights in books such as "Machinery Failure Analysis and Troubleshooting" have shaped modern reliability practices. BIG BEN Training Center has structured this course to bridge the gap between theoretical knowledge and real-world application, ensuring that attendees can immediately implement learned strategies to enhance equipment reliability, reduce downtime, and optimize performance within their organizations. This journey from A to Z in rotating equipment management will empower professionals to diagnose complex problems and engineer lasting solutions.

Target Audience / This training course is suitable for:

- Mechanical Engineers.
- Maintenance Technicians and Supervisors.
- Reliability Engineers and Specialists.
- Plant and Operations Managers.
- Rotating Equipment Engineers.
- Condition Monitoring Specialists.
- Project Engineers involved with mechanical equipment.
- Technical staff seeking to enhance their machinery expertise.

Target Sectors and Industries:

- Oil and Gas Production and Refining.
- Petrochemical and Chemical Processing.
- Power Generation (Fossil, Nuclear, and Renewables).
- Heavy Manufacturing and Industrial Production.
- Water and Wastewater Treatment Facilities.
- Pharmaceutical and Food Processing.
- Mining and Mineral Processing.
- Government agencies and public sector utilities.

Target Organizations Departments:

- Maintenance and Reliability Departments.
- Engineering and Technical Support.
- Plant Operations and Production.
- Asset Management and Integrity.
- Inspection and Condition Monitoring Units.
- Project Management and Execution.
- Health, Safety, and Environment (HSE).

Course Offerings:

By the end of this course, the participants will have able to:

- Identify various types of rotating equipment and their critical components.
- Develop and implement effective preventive and predictive maintenance plans.
- Master precision alignment and balancing techniques to extend machinery life.
- Apply best practices in lubrication management and oil analysis interpretation.
- Utilize vibration analysis and other condition monitoring tools to detect incipient failures.
- Systematically troubleshoot common and complex problems in pumps, compressors, and turbines.
- Conduct Root Cause Failure Analysis (RCFA) to prevent recurrence of failures.
- Enhance overall equipment reliability and plant availability.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to foster a dynamic and engaging learning environment that maximizes knowledge retention and practical application. This course moves beyond traditional lectures by integrating a balanced mix of interactive presentations, detailed case studies from various industries, and collaborative group workshops. Participants will be encouraged to share their own professional experiences and challenges, creating a rich forum for peer-to-peer learning and problem-solving. The instructor will facilitate sessions that include video demonstrations of maintenance techniques, hands-on analysis of equipment failure data, and exercises in developing troubleshooting flowcharts. Emphasis is placed on a practical, results-oriented approach, ensuring that theoretical concepts are always linked to tangible operational outcomes. Continuous feedback and interactive Q&A sessions are woven throughout the five days to address specific queries and reinforce key learning points. This immersive methodology ensures that participants leave not just with new knowledge, but with the confidence and skills to apply it directly in their workplace.

Course Agenda (Course Units):

Unit One: Fundamentals of Rotating Machinery

- Introduction to rotating equipment categories (pumps, compressors, turbines, gearboxes).
- Key principles of fluid dynamics and thermodynamics in machinery.
- Detailed breakdown of essential components: bearings, seals, couplings, and shafts.
- Understanding machinery performance curves and operating envelopes.
- Materials science and selection for rotating equipment components.
- Introduction to industry standards (API, ISO) for machinery.
- Safety protocols and best practices for working with rotating equipment.

Unit Two: Essential Maintenance Practices and Reliability

- Developing a robust preventive maintenance (PM) program.
- Principles of predictive maintenance (PdM) and its implementation.
- Precision maintenance techniques: shaft alignment methods (dial indicator and laser).
- Fundamentals of rotor balancing and its importance.
- Lubrication principles: selecting the right lubricant and application methods.
- Best practices for lubricant storage, handling, and contamination control.
- Introduction to reliability-centered maintenance (RCM) concepts.

Unit Three: Condition Monitoring and Diagnostics Techniques

- Fundamentals of vibration analysis for fault detection.
- Interpreting vibration spectra to identify unbalance, misalignment, and bearing defects.
- Practical application of oil analysis and wear debris analysis.
- Infrared thermography for detecting mechanical and electrical anomalies.
- Introduction to other non-destructive testing (NDT) methods like acoustic emission.
- Monitoring process parameters for machinery health assessment.
- Integrating various condition monitoring technologies for a comprehensive diagnosis.

Unit Four: Troubleshooting Pumps, Compressors, and Turbines

- Systematic troubleshooting methodologies and logical frameworks.
- Common failure modes and symptoms in centrifugal and positive displacement pumps.
- Diagnosing issues in dynamic and positive displacement compressors.
- Troubleshooting common problems in steam and gas turbines.
- Analysis of mechanical seal and bearing failures.
- Developing and using troubleshooting charts and checklists.
- Case studies on complex machinery failure investigations.

Unit Five: Advanced Failure Analysis and Modern Technologies

- Introduction to Root Cause Failure Analysis (RCFA) techniques.
- Applying the 5-Whys and Fishbone (Ishikawa) diagrams to machinery failures.
- Documenting and reporting failure analysis findings effectively.
- Strategies for improving Mean Time Between Failures (MTBF).
- Introduction to the Industrial Internet of Things (IIoT) in machinery monitoring.
- The role of Artificial Intelligence and Machine Learning in predictive analytics.
- Final review, open forum, and developing a personal action plan for implementation.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Considering the rise of IIoT and AI, how might the traditional role of a reliability engineer evolve from reactive problem-solving to proactive system optimization in the next decade?

What unique qualities does this course offer compared to other courses?

This training course distinguishes itself by moving beyond a purely theoretical or component-specific focus to offer a holistic, system-oriented perspective on rotating equipment reliability. While other programs may concentrate on individual techniques like vibration analysis or alignment, this course integrates these skills into a comprehensive framework of maintenance strategy and root cause failure analysis. The curriculum is meticulously designed to foster critical thinking, empowering participants not just to fix a problem, but to understand its fundamental cause and prevent its recurrence. We emphasize the "why" behind the "how," exploring the engineering principles that govern machinery behavior and failure. Furthermore, the course content is dynamic, incorporating discussions on emerging technologies like IIoT and AI in predictive maintenance, ensuring the skills learned are relevant for the future. The pedagogical approach, centered on real-world case studies and interactive problem-solving sessions, ensures that participants can translate classroom knowledge into measurable improvements in plant availability, safety, and profitability. It is an academically rigorous yet intensely practical program for the modern industrial professional.