

Course No. 2032

Advanced Rotating Equipment Maintenance & Troubleshooting Training Course

MAINTENANCE ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Advanced Rotating Equipment Maintenance & Troubleshooting Training Course provides an advanced practical framework for maintaining, diagnosing, and troubleshooting critical rotating machinery in demanding industrial environments. The programme is designed for professionals who need to move beyond routine maintenance toward advanced fault diagnosis, reliability improvement, and systematic failure prevention.

Participants will explore advanced maintenance requirements for pumps, compressors, turbines, motors, gearboxes, fans, blowers, couplings, bearings, mechanical seals, and other rotating equipment. The course examines the interaction between mechanical condition, operating parameters, lubrication, alignment, vibration, process conditions, and maintenance practices.

A major focus is placed on diagnosing complex and recurring equipment problems. Participants will learn how to combine vibration trends, operating data, inspection findings, lubrication analysis, equipment history, and failure evidence to identify failure mechanisms and establish technically justified root causes.

The programme also addresses advanced maintenance strategy development, condition monitoring, reliability-centered maintenance, overhaul planning, maintenance optimization, spare parts, performance indicators, and corrective action management. Practical case studies and troubleshooting exercises enable participants to develop solutions for complex rotating equipment problems and improve equipment availability and lifecycle performance.

Objectives

- By the end of this training course, participants will be able to:
- Analyze advanced maintenance requirements for critical rotating equipment.
- Evaluate equipment condition and reliability using multiple sources of technical data.
- Diagnose complex mechanical and operational equipment failures.
- Analyze vibration patterns associated with advanced equipment faults.
- Evaluate alignment, balancing, lubrication, bearing, seal, and coupling conditions.
- Assess the influence of operating and process conditions on equipment performance.

- Apply advanced root cause failure analysis techniques.
- Identify recurring and systemic equipment failure mechanisms.
- Develop advanced preventive and predictive maintenance strategies.
- Integrate condition monitoring results into maintenance decision-making.
- Optimize maintenance tasks, intervals, and intervention priorities.
- Evaluate overhaul and repair requirements for critical rotating machinery.
- Develop corrective and preventive actions for complex equipment failures.
- Assess spare parts and maintenance resource requirements.
- Establish reliability and maintenance performance measures.
- Develop an advanced rotating equipment maintenance and troubleshooting strategy.

Who Should Attend

This course is designed for senior maintenance engineers, reliability engineers, rotating equipment engineers, mechanical engineers, maintenance managers, and technical specialists responsible for complex rotating machinery.

It is also suitable for condition monitoring specialists, vibration analysts, inspection engineers, lubrication specialists, maintenance planners, engineering managers, reliability leaders, equipment specialists, supervisors, and experienced maintenance technicians involved in advanced troubleshooting and reliability improvement.

The programme is particularly relevant to professionals working in oil and gas, refineries, petrochemicals, power generation, energy, chemical processing, manufacturing, water and utilities, mining, marine operations, and other asset-intensive industries.

Learning Outcomes

- Upon completion of the course, participants will be able to:
- Conduct advanced assessments of rotating equipment condition and reliability.
- Diagnose complex failures using vibration, temperature, lubrication, and operating data.
- Identify advanced failure mechanisms affecting pumps, compressors, turbines, motors, and gearboxes.

- Analyze combined mechanical and process-related failure conditions.
- Evaluate alignment, balancing, bearing, seal, coupling, and lubrication problems.
- Interpret complex vibration trends and diagnostic information.
- Integrate inspection findings and equipment history into failure investigations.
- Conduct advanced root cause failure analysis for recurring failures.
- Distinguish technical, operational, maintenance, and systemic causes of failure.
- Develop optimized predictive and preventive maintenance programmes.
- Integrate condition monitoring with reliability-centered maintenance.
- Determine appropriate repair, overhaul, replacement, or continued-operation strategies.
- Develop technically justified corrective and preventive actions.
- Improve maintenance planning, execution, and resource utilization.
- Establish reliability indicators and performance improvement measures.
- Prepare an advanced maintenance and troubleshooting strategy for critical rotating equipment.

Course Outline

DAY 01

Advanced Rotating Equipment Reliability and Maintenance Strategy

- Advanced principles of rotating equipment reliability
- Equipment lifecycle and reliability performance
- Criticality assessment and risk-based maintenance
- Advanced maintenance strategy selection
- Failure mechanisms and equipment degradation
- Pumps, compressors, turbines, motors, gearboxes, and auxiliary systems
- Equipment operating envelopes and performance monitoring
- Maintenance history and reliability data analysis
- Reliability-centered maintenance integration

PRACTICAL APPLICATION

Developing an advanced maintenance strategy for critical rotating equipment

DAY 02

Advanced Condition Monitoring and Fault Diagnosis

- Advanced condition monitoring principles
- Vibration analysis and diagnostic techniques
- Complex vibration patterns and fault signatures
- Bearing, gear, shaft, coupling, and seal diagnostics
- Lubrication and oil condition analysis
- Temperature and thermographic monitoring
- Operating parameter and process data analysis
- Combining multiple condition indicators
- Trend analysis and early fault detection

PRACTICAL APPLICATION

Diagnosing complex rotating equipment faults using condition monitoring data

DAY 03

Advanced Troubleshooting and Root Cause Failure Analysis

- Systematic troubleshooting of complex equipment failures
- Failure mode and mechanism analysis
- Advanced root cause failure analysis
- Misalignment, imbalance, looseness, resonance, and shaft problems
- Bearing and lubrication-related failures
- Seal and coupling failures
- Process-induced mechanical problems
- Human, maintenance, design, and operational contributors
- Recurring and systemic failure analysis

PRACTICAL APPLICATION

Conducting an advanced root cause investigation

DAY 04

Maintenance Optimization, Overhaul and Reliability Improvement

- Advanced preventive and predictive maintenance
- Maintenance task and interval optimization
- Condition-based maintenance decisions
- Repair versus replacement decisions
- Overhaul and major maintenance requirements
- Spare parts criticality and resource planning
- Maintenance execution and quality control
- Corrective action effectiveness
- Reliability improvement initiatives

PRACTICAL APPLICATION

Developing an optimized maintenance and overhaul plan

DAY 05

Integrated Maintenance Management and Continuous Improvement

- Reliability and maintenance performance indicators
- Equipment availability and downtime analysis
- Maintenance cost and lifecycle performance
- Failure trend and reliability analysis
- Management reporting and technical recommendations
- Digital maintenance and computerized maintenance management systems
- Reliability improvement programmes
- Lessons learned and knowledge management
- Continuous improvement and failure prevention
- Final Integrated Workshop: Developing an Advanced Rotating Equipment Maintenance & Troubleshooting Strategy for a critical equipment system



Register or Request More Information

Course page: <https://quest-training.com/courses/advanced-rotating-equipment-maintenance-troubleshooting-training-course>

Website: <https://quest-training.com>

Email: info@quest-training.com

Phone: +905016771440

