

Course No. 2026

Predictive Maintenance & Condition Monitoring for Rotating Machinery Training Course

RELIABILITY & ASSET MANAGEMENT
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Predictive Maintenance & Condition Monitoring for Rotating Machinery Training Course provides a practical framework for implementing predictive maintenance and condition monitoring programmes for critical rotating equipment. The course focuses on using equipment condition data to detect developing faults, assess equipment health, optimize maintenance decisions, and reduce unexpected failures and operational disruptions.

Participants will examine the principles and applications of condition monitoring for pumps, compressors, turbines, motors, fans, blowers, gearboxes, and other rotating machinery. The programme covers vibration analysis, lubrication monitoring, thermography, motor current analysis, ultrasound, operating parameter monitoring, and other techniques used to evaluate equipment condition.

The course emphasizes the interpretation of condition monitoring data and its integration with maintenance strategies. Participants will learn how to establish equipment baselines, identify abnormal conditions, recognize early failure indicators, assess severity, determine appropriate maintenance actions, and prioritize interventions according to equipment criticality and risk.

Through practical data analysis, diagnostic exercises, equipment case studies, trend analysis, and an integrated workshop, participants will develop the ability to design and manage predictive maintenance programmes, improve maintenance planning, extend equipment life, and strengthen reliability and operational performance.

Objectives

- By the end of this training course, participants will be able to:
- Explain the principles and objectives of predictive maintenance and condition monitoring.
- Analyze the relationship between equipment condition, failure mechanisms, and maintenance strategy.
- Identify appropriate condition monitoring techniques for different rotating machinery.
- Evaluate equipment criticality and determine monitoring priorities.
- Apply vibration monitoring principles to rotating equipment.

- Analyze lubrication condition and contamination indicators.
- Evaluate thermographic and operating parameter data.
- Apply appropriate techniques for detecting developing equipment faults.
- Establish equipment condition baselines and acceptable operating ranges.
- Interpret trends and identify abnormal changes in equipment condition.
- Assess the severity and potential consequences of detected anomalies.
- Integrate condition monitoring results with maintenance planning and scheduling.
- Develop risk-based maintenance recommendations based on equipment condition.
- Evaluate the effectiveness of predictive maintenance programmes.
- Establish appropriate condition monitoring indicators and reporting mechanisms.
- Develop an integrated predictive maintenance and condition monitoring framework.

Who Should Attend

This course is designed for maintenance engineers, reliability engineers, mechanical engineers, rotating equipment engineers, condition monitoring specialists, vibration analysts, maintenance planners, and technical professionals responsible for equipment reliability and maintenance performance.

It is also suitable for maintenance managers, engineering managers, operations professionals, inspection specialists, lubrication specialists, equipment engineers, reliability leaders, and supervisors involved in predictive maintenance, asset performance, and equipment health monitoring.

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

Learning Outcomes

- Upon completion of the course, participants will be able to:
- Develop a structured predictive maintenance programme for rotating machinery.
- Select suitable condition monitoring techniques based on equipment type and criticality.

- Establish equipment condition baselines and monitoring parameters.
- Collect and validate condition monitoring data.
- Interpret vibration measurements and identify common abnormal patterns.
- Analyze lubrication and contamination-related indicators.
- Evaluate temperature and thermographic information.
- Monitor operating parameters and identify deviations from normal conditions.
- Recognize early indicators of mechanical and operational deterioration.
- Assess equipment health and failure risk using condition data.
- Prioritize maintenance interventions according to condition and criticality.
- Convert condition monitoring findings into actionable maintenance recommendations.
- Integrate predictive maintenance with preventive and corrective maintenance programmes.
- Develop condition monitoring reports and management dashboards.
- Measure predictive maintenance effectiveness using relevant reliability indicators.
- Prepare a practical roadmap for improving rotating machinery reliability through predictive maintenance.

Course Outline

DAY 01

Predictive Maintenance Strategy and Rotating Machinery Reliability

- Principles of predictive maintenance
- Predictive versus preventive and corrective maintenance
- Equipment failure patterns and failure development
- Reliability-centered maintenance concepts
- Rotating machinery criticality assessment
- Condition monitoring programme structure
- Equipment monitoring priorities and critical assets
- Establishing equipment health baselines
- Maintenance strategy selection

DAY 01 — CONTINUED

PRACTICAL APPLICATION

Developing a predictive maintenance strategy for a rotating equipment fleet

DAY 02**Vibration Monitoring and Mechanical Condition Assessment**

- Fundamentals of vibration in rotating machinery
- Vibration measurement and monitoring methods
- Vibration trends and alarm limits
- Imbalance, misalignment, looseness, and resonance
- Bearing and gear fault indicators
- Shaft and coupling condition
- Vibration spectrum and waveform interpretation
- Trending and diagnostic decision-making

PRACTICAL APPLICATION

Analyzing vibration data from rotating equipment

DAY 03**Lubrication, Thermography and Additional Monitoring Techniques**

- Lubrication condition monitoring
- Oil analysis and contamination detection
- Wear debris and lubricant degradation
- Temperature monitoring and thermography
- Motor current and electrical condition monitoring
- Ultrasound and acoustic monitoring
- Process and operating parameter monitoring
- Integrating multiple condition monitoring technologies

DAY 03 — CONTINUED

PRACTICAL APPLICATION

Evaluating multiple condition indicators for an equipment failure scenario

DAY 04

Diagnostics, Risk Assessment and Maintenance Decision-Making

- Equipment health assessment
- Fault diagnosis and failure progression
- Identifying early warning indicators
- Severity assessment and alarm management
- Risk-based prioritization of equipment anomalies
- Converting monitoring results into maintenance actions
- Maintenance intervention timing
- Integration with maintenance planning and scheduling
- Work order generation and technical recommendations

PRACTICAL APPLICATION

Developing a condition-based maintenance action plan

DAY 05

Predictive Maintenance Programme Management and Continuous Improvement

- Predictive maintenance performance management
- Reliability and maintenance indicators
- Condition monitoring reports and dashboards
- Data quality and information management
- Technology, automation, and digital condition monitoring
- Integration with computerized maintenance management systems

DAY 05 — CONTINUED

- Programme effectiveness and return on maintenance investment
- Continuous improvement of predictive maintenance programmes
- Reliability improvement and equipment life extension
- Final Integrated Workshop: Developing a complete Predictive Maintenance & Condition Monitoring Programme for a critical rotating machinery fleet

Register or Request More Information

Course page: <https://quest-training.com/courses/predictive-maintenance-condition-monitoring-for-rotating-machinery-training-course>

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