QUEST
Professional Center

PROFESSIONAL TRAINING COURSE

Course No. 2027

Reliability-Centered Maintenance (RCM) for Rotating Equipment Training Course

RELIABILITY & ASSET MANAGEMENT
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION
5 Days

DELIVERY
Classroom

Course Overview

The Reliability-Centered Maintenance (RCM) for Rotating Equipment Training Course provides a structured and practical framework for applying reliability-centered maintenance principles to critical rotating machinery. The programme focuses on developing maintenance strategies based on equipment functions, failure modes, consequences, and risk rather than relying solely on traditional time-based maintenance approaches.

Participants will examine how RCM can be applied to pumps, compressors, turbines, motors, fans, blowers, gearboxes, and other rotating equipment. The course addresses functional requirements, functional failures, failure modes, failure effects, failure consequences, and the selection of appropriate maintenance tasks for different equipment failure scenarios.

The programme emphasizes the integration of preventive, predictive, condition-based, corrective, and proactive maintenance within a risk-based reliability framework. Participants will learn how to determine when scheduled maintenance is appropriate, when condition monitoring provides greater value, and when redesign, operational changes, or failure-finding tasks may be required.

Through practical RCM analysis, equipment case studies, failure mode evaluation, maintenance task selection, criticality assessment, and an integrated workshop, participants will develop the ability to build optimized maintenance programmes, improve equipment availability, reduce unnecessary maintenance, and strengthen the reliability and lifecycle performance of rotating assets.

Objectives

- By the end of this training course, participants will be able to:
- Explain the principles, objectives, and methodology of Reliability-Centered Maintenance.
- Analyze the relationship between equipment functions, failures, and reliability.
- Identify critical rotating equipment and assess its operational importance.
- Define functional requirements and functional failures.
- Identify and classify failure modes affecting rotating machinery.
- Evaluate failure effects and consequences.

- Apply risk-based criteria to prioritize equipment failures.
- Select appropriate preventive and predictive maintenance tasks.
- Determine when condition-based maintenance is more appropriate than time-based maintenance.
- Evaluate corrective, proactive, and failure-finding maintenance strategies.
- Analyze maintenance intervals and task effectiveness.
- Develop RCM decision logic for different failure scenarios.
- Integrate condition monitoring with RCM maintenance strategies.
- Evaluate the cost, risk, and reliability impact of maintenance decisions.
- Establish performance measures for RCM programmes.
- Develop an optimized RCM-based maintenance strategy for rotating equipment.

Who Should Attend

This course is designed for reliability engineers, maintenance engineers, mechanical engineers, rotating equipment engineers, maintenance planners, condition monitoring specialists, and asset management professionals responsible for equipment reliability and maintenance strategy.

It is also suitable for maintenance managers, engineering managers, operations professionals, reliability leaders, equipment specialists, inspection professionals, vibration analysts, lubrication specialists, and supervisors involved in maintenance optimization and reliability improvement.

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:
- Apply the RCM methodology to critical rotating equipment.
- Develop functional descriptions for rotating machinery.
- Identify functional failures and their operational consequences.

- Conduct structured failure mode analysis.
- Evaluate the effects and consequences of different failure modes.
- Classify failures according to safety, environmental, operational, and financial consequences.
- Prioritize maintenance requirements based on equipment criticality and risk.
- Select appropriate preventive maintenance tasks.
- Select suitable predictive and condition-based maintenance techniques.
- Determine appropriate maintenance intervals using failure characteristics and equipment condition.
- Identify situations where corrective maintenance is the most appropriate strategy.
- Develop failure-finding tasks for hidden or protective system failures.
- Integrate vibration, lubrication, thermography, and other condition monitoring techniques into RCM programmes.
- Evaluate maintenance task effectiveness and eliminate unnecessary activities.
- Establish RCM performance indicators and review mechanisms.
- Develop a practical reliability-centered maintenance programme for rotating equipment.

Course Outline

DAY 01

RCM Principles and Rotating Equipment Reliability

- Fundamentals and objectives of Reliability-Centered Maintenance
- Evolution from traditional maintenance to reliability-centered strategies
- Equipment functions and performance standards
- Functional failures and failure consequences
- Equipment criticality and reliability priorities
- Rotating equipment reliability challenges
- Pumps, compressors, turbines, motors, gearboxes, fans, and blowers
- RCM process and decision framework

> **PRACTICAL APPLICATION**
>
> Selecting and defining a critical rotating equipment system for RCM analysis

DAY 02

Failure Modes, Effects and Consequences

- Failure mode identification
- Mechanical and operational failure mechanisms
- Bearing, shaft, seal, coupling, gear, and lubrication failures
- Misalignment, imbalance, looseness, and resonance
- Failure effects and equipment performance
- Safety, environmental, operational, and financial consequences
- Failure criticality and risk classification
- Failure history and reliability data

> **PRACTICAL APPLICATION**
> Conducting a failure mode and effects analysis for rotating equipment

DAY 03

RCM Maintenance Task Selection

- RCM decision logic and maintenance task selection
- Time-based preventive maintenance
- Condition-based and predictive maintenance
- On-condition tasks and condition monitoring
- Failure-finding tasks for hidden failures
- Corrective and run-to-failure strategies
- Proactive maintenance and failure elimination
- Maintenance interval optimization

> **PRACTICAL APPLICATION**
> Selecting appropriate RCM tasks for different rotating equipment failure modes

DAY 04

RCM Implementation and Maintenance Optimization

- Developing RCM maintenance programmes
- Integrating vibration monitoring and condition assessment
- Lubrication and oil analysis within RCM
- Thermography and additional monitoring technologies
- Maintenance planning and scheduling
- Spare parts and maintenance resource requirements
- Risk, cost, and reliability trade-offs
- Eliminating unnecessary preventive maintenance
- Monitoring RCM implementation effectiveness

> **PRACTICAL APPLICATION**
>
> Developing an optimized RCM maintenance plan

DAY 05

RCM Governance, Performance and Continuous Improvement

- RCM programme governance and accountability
- Reliability and maintenance performance indicators
- Measuring equipment availability and maintenance effectiveness
- Failure trend analysis and maintenance strategy review
- Continuous improvement and lessons learned
- Integration with computerized maintenance management systems
- Reliability culture and organizational implementation
- Lifecycle asset performance improvement
- Management reporting and RCM strategy reviews
- Final Integrated Workshop: Developing a complete Reliability-Centered Maintenance programme for a critical rotating equipment system

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Register or Request More Information

Course page: https://quest-training.com/courses/reliability-centered-maintenance-rcm-for-rotating-equipment-training-course
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