

Course No. 1343

Reliability Centered Maintenance Training Course

MAINTENANCE ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Reliability Centered Maintenance (RCM) Training Course provides a systematic framework for developing maintenance strategies that protect asset function, manage operational risk, and improve reliability across critical equipment and systems. The course enables organizations to make informed maintenance decisions based on asset purpose, functional failure, failure modes, consequences, and the most appropriate maintenance tasks.

Reliability Centered Maintenance is particularly important for government entities, ministries, public sector organizations, banks and financial institutions, oil and gas companies, utilities, transport operators, infrastructure providers, and large corporations that depend on critical assets and uninterrupted services. RCM helps organizations move beyond generic maintenance intervals and reactive responses by applying a structured, risk-based approach that focuses maintenance resources on the assets and failure consequences that matter most.

This Reliability Centered Maintenance Training Course examines the full RCM process, including asset selection, function definition, functional failures, failure modes, effects, consequences, maintenance task selection, and implementation planning. Participants will learn how to distinguish between hidden and evident failures, identify safety and operational consequences, assess failure characteristics, and select technically feasible and cost-justified maintenance actions.

The course links RCM with asset management, reliability engineering, preventive maintenance, predictive maintenance, condition monitoring, root cause analysis, risk management, and maintenance planning. It helps executives and managers establish a clear maintenance strategy and governance approach, while enabling engineers and maintenance specialists to conduct structured RCM analyses and improve maintenance plans using evidence and operational knowledge.

Through practical exercises, failure analysis workshops, and implementation planning, participants will gain the capability to apply RCM principles in their own workplace. The course supports more reliable, risk-informed, and sustainable maintenance practices that contribute to asset availability, safety, compliance, service continuity, operational efficiency, and lifecycle asset value.

Objectives

- Analyze the principles of Reliability Centered Maintenance and their relationship to asset management, reliability, risk, safety, and operational performance during the course.
- Assess selected assets and systems to determine their functions, performance standards, criticality, and maintenance strategy requirements.
- Develop clear functional statements that define what an asset must do, the required performance level, and the operating context.
- Identify functional failures, failure modes, failure effects, and failure consequences using a structured RCM analysis process.
- Evaluate the difference between evident and hidden failures and assess their safety, environmental, operational, financial, and compliance implications.
- Apply RCM decision logic to select suitable preventive, predictive, condition-based, failure-finding, redesign, or run-to-failure maintenance strategies.
- Design maintenance tasks that define task content, frequency, triggers, acceptance criteria, responsibilities, and required resources.
- Improve maintenance plans by eliminating ineffective tasks and aligning maintenance activities with actual failure characteristics and risk.
- Strengthen coordination between maintenance, operations, engineering, HSE, asset management, and finance through shared RCM decision criteria.
- Implement RCM analysis findings through CMMS or EAM work plans, preventive maintenance programs, inspection routines, and performance monitoring.
- Assess the effectiveness of selected maintenance strategies through measurable reliability, availability, failure, cost, and compliance indicators.
- Develop a time-bound action plan for applying Reliability Centered Maintenance in the participant's organization.

Who Should Attend

The Reliability Centered Maintenance Training Course is designed for maintenance managers, reliability managers, asset managers, engineering managers, operations managers, facilities managers, plant managers, technical services leaders, integrity managers, and risk management professionals. It is particularly relevant for executives, directors, and decision makers responsible for critical asset performance, service continuity, safety, operational resilience, maintenance investment, compliance, and lifecycle cost management.

The course is suitable for reliability engineers, maintenance engineers, mechanical engineers, electrical engineers, instrumentation and control engineers, process engineers, inspection engineers, asset performance specialists, maintenance planners, schedulers, supervisors, condition monitoring specialists, and CMMS or EAM administrators. It supports professionals who are responsible for equipment strategies, maintenance plans, criticality assessments, preventive maintenance, inspection programs, failure analysis, and reliability improvement initiatives.

HSE, quality, procurement, supply chain, finance, internal audit, project management, digital transformation, operational excellence, and contractor management professionals may also benefit where their responsibilities include asset risk, equipment integrity, statutory maintenance, maintenance contracts, spare-parts strategy, performance assurance, or investment decisions. The course supports cross-functional teams that need a common methodology for determining how assets should be maintained and how maintenance resources should be prioritized.

Learning Outcomes

- Explain the purpose of Reliability Centered Maintenance and its contribution to reliability, availability, safety, compliance, and lifecycle asset value.
- Identify assets and systems that should be prioritized for RCM analysis based on criticality, risk, operational importance, and failure history.
- Define asset functions and required performance standards within the relevant operating context.
- Identify functional failures, failure modes, failure effects, and failure consequences for selected assets.
- Distinguish between evident and hidden failures and evaluate their impact on safety, environment, operations, quality, and cost.
- Apply RCM decision logic to select technically appropriate and economically reasonable maintenance strategies.
- Develop preventive, condition-based, predictive, failure-finding, redesign, or run-to-failure tasks for defined failure modes.
- Establish task frequencies, inspection criteria, alarm limits, acceptance standards, and responsibilities for selected maintenance activities.
- Review existing maintenance plans and identify ineffective, duplicated, unnecessary, or misaligned maintenance tasks.

- Integrate RCM outputs into CMMS or EAM systems, work orders, job plans, inspection programs, and asset performance reports.
- Monitor maintenance strategy effectiveness using reliability, availability, failure recurrence, compliance, and cost indicators.
- Produce an initial RCM implementation roadmap relevant to the participant's asset portfolio or operational area.

Course Outline

DAY 01

Reliability Centered Maintenance Foundations and Asset Strategy

- The purpose, principles, and business value of Reliability Centered Maintenance in asset-intensive and service-critical organizations.
- The relationship between RCM, asset management, reliability engineering, risk management, maintenance excellence, and operational resilience.
- Maintenance strategies: reactive, preventive, condition-based, predictive, failure-finding, redesign, and run-to-failure maintenance.
- Asset selection, system boundaries, operating context, asset criticality, and prioritization for RCM analysis.

PRACTICAL APPLICATION OR DISCUSSION

Identifying critical assets and determining priorities for an RCM study.

DAY 02

Functions, Functional Failures, and Failure Analysis

- Defining primary and secondary asset functions, performance standards, operating requirements, and service expectations.
- Identifying functional failures and understanding how assets fail to meet required performance standards.
- Failure modes, degradation mechanisms, human factors, environmental conditions, process interfaces, and external influences.

DAY 02 — CONTINUED

- Failure effects, evidence requirements, operating impact, safety implications, quality effects, and maintenance history review.

PRACTICAL APPLICATION OR DISCUSSION

Developing functional statements and identifying failure modes for a selected asset or system.

DAY 03

Failure Consequences and RCM Decision Logic

- Failure consequence categories: hidden, safety and environmental, operational, and non-operational consequences.
- Evident and hidden failures, protective devices, standby systems, alarms, emergency functions, and failure-finding requirements.
- Applying RCM decision logic to determine whether proactive, condition-based, failure-finding, redesign, or no-scheduled-maintenance actions are appropriate.
- Technical feasibility, task effectiveness, economic considerations, operational constraints, and risk acceptance criteria.

PRACTICAL APPLICATION OR DISCUSSION

Applying RCM decision logic to selected failure modes and documenting maintenance decisions.

DAY 04

Maintenance Task Development and Implementation

- Developing time-directed, condition-directed, failure-finding, and one-time change tasks.
- Defining task content, job plans, frequencies, triggers, acceptance criteria, alarm limits, safety requirements, and resource needs.
- Integrating RCM findings with preventive maintenance programs, condition monitoring, inspection plans, shutdown scopes, and reliability initiatives.
- Configuring RCM outputs in CMMS or EAM systems, including work orders, task lists, failure codes, asset records, and reporting structures.

DAY 04 — CONTINUED

PRACTICAL APPLICATION OR DISCUSSION

Designing maintenance tasks and translating RCM recommendations into a practical maintenance plan.

DAY 05

Governance, Performance Review, and RCM Implementation Planning

- RCM governance, team roles, analysis facilitation, stakeholder engagement, decision documentation, and approval processes.
- Maintenance strategy review, reliability performance indicators, task compliance, repeat failures, availability, downtime, and cost monitoring.
- Reviewing task effectiveness, managing change, updating RCM studies, and incorporating lessons learned from failures and operational experience.
- Building organizational capability through training, cross-functional collaboration, data quality, and continuous improvement.

FINAL WORKSHOP, ACTION PLAN, OR IMPLEMENTATION EXERCISE

Developing a 90-day Reliability Centered Maintenance implementation plan with priority assets, team roles, milestones, resource requirements, and performance measures.

Register or Request More Information

Course page: <https://quest-training.com/courses/reliability-centered-maintenance-training-course>

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