

Course No. 1336

Predictive Maintenance Training Course

MAINTENANCE ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Predictive Maintenance Training Course equips maintenance, reliability, operations, and asset management professionals with the practical knowledge required to anticipate equipment failures before they disrupt production, safety, quality, or service delivery. The course provides a structured approach to using condition monitoring data, equipment history, risk analysis, and maintenance intelligence to make better maintenance decisions across complex asset-intensive environments.

For government entities, public utilities, banks with critical facilities, oil and gas organizations, manufacturing sites, transport operators, and large corporations, predictive maintenance supports operational resilience and disciplined asset stewardship. It helps organizations move beyond reactive repairs and routine time-based maintenance toward targeted interventions based on actual equipment condition, failure risk, and business impact.

Participants will examine the principles, processes, and technologies that underpin effective predictive maintenance programs. They will learn how to identify critical assets, select appropriate monitoring techniques, interpret early warning indicators, assess data quality, and convert findings into practical maintenance actions. The course also addresses the governance, workforce capability, and cross-functional coordination needed to sustain predictive maintenance at organizational scale.

The program is designed to connect technical maintenance practices with executive priorities, including asset availability, lifecycle value, production continuity, cost control, compliance, safety, and risk management. Through practical exercises, case-based discussions, and implementation planning, participants will gain a clear framework for strengthening maintenance performance and developing a fit-for-purpose predictive maintenance roadmap.

Objectives

- Analyze the role of predictive maintenance within an integrated asset management and reliability strategy by the end of the course.
- Assess critical equipment and systems using operational, safety, financial, and service-impact criteria during structured workshop activities.
- Evaluate common failure modes and degradation patterns using practical failure analysis techniques within the course context.

- Apply condition-based maintenance principles to distinguish between reactive, preventive, predictive, and proactive maintenance approaches.
- Develop equipment monitoring plans that define asset scope, inspection intervals, warning indicators, responsibilities, and escalation actions.
- Interpret vibration, thermal, lubrication, ultrasonic, electrical, and operational performance data using guided examples and case exercises.
- Design practical alarm limits and decision rules that support timely maintenance intervention before functional failure occurs.
- Improve maintenance work planning by converting condition-monitoring findings into prioritized, executable work orders.
- Strengthen collaboration between maintenance, operations, engineering, procurement, and management through defined predictive maintenance workflows.
- Implement data quality controls and reporting practices that improve the reliability of maintenance intelligence during the course exercises.
- Align predictive maintenance initiatives with organizational risk, safety, compliance, budget, and performance objectives.
- Develop a time-bound predictive maintenance action plan for application within the participant's workplace.

Who Should Attend

This Predictive Maintenance Training Course is designed for maintenance managers, reliability managers, asset managers, engineering managers, plant managers, facilities managers, operations managers, and technical services leaders responsible for improving equipment reliability and asset performance. It is particularly relevant for executives and decision makers who oversee capital-intensive operations and need to understand how predictive maintenance contributes to risk reduction, operational continuity, budget optimization, and lifecycle asset value.

The course is also suitable for maintenance engineers, reliability engineers, mechanical engineers, electrical engineers, instrumentation and control specialists, condition monitoring technicians, inspection personnel, maintenance planners, schedulers, CMMS and EAM system users, and technical analysts. Professionals involved in rotating equipment, utilities, buildings and facilities, power systems, process plants, fleets, infrastructure, and critical operational assets will benefit from the practical methods covered.

Procurement, supply chain, HSE, quality, finance, digital transformation, and operational excellence professionals may also attend where their roles involve maintenance service contracts, spare-parts strategy, equipment risk, maintenance budgeting, performance reporting, or technology-enabled asset management. The course supports cross-functional teams seeking a common language and disciplined process for predictive maintenance implementation.

Learning Outcomes

- Explain how predictive maintenance supports reliability, availability, safety, service continuity, and asset lifecycle performance.
- Differentiate between reactive, preventive, condition-based, predictive, and proactive maintenance strategies.
- Identify critical assets that should be prioritized for predictive maintenance based on risk and business impact.
- Conduct a basic failure mode review to determine relevant degradation mechanisms and monitoring requirements.
- Select appropriate condition monitoring techniques for common mechanical, electrical, process, and facility assets.
- Interpret key condition indicators and recognize trends that may signal developing equipment problems.
- Establish practical monitoring frequencies, alarm thresholds, escalation routes, and response requirements.
- Translate diagnostic findings into prioritized maintenance work orders, inspections, repairs, or engineering actions.
- Use CMMS, EAM, historian, and maintenance records more effectively to support predictive maintenance decisions.
- Evaluate the quality, completeness, and usefulness of maintenance and condition-monitoring data.
- Communicate predictive maintenance findings clearly to operations, leadership, and other stakeholders.
- Produce an initial workplace action plan for improving predictive maintenance capability and governance.

Course Outline

DAY 01

Foundations of Predictive Maintenance and Asset Reliability

- The business case for predictive maintenance in asset-intensive organizations
- Maintenance strategy evolution: reactive, preventive, condition-based, predictive, and proactive maintenance
- Reliability, availability, maintainability, asset criticality, and operational risk
- The relationship between predictive maintenance, asset management, HSE, quality, compliance, and business continuity

PRACTICAL APPLICATION OR DISCUSSION

Assessing the current maintenance maturity and operational challenges within participant organizations

DAY 02

Asset Criticality, Failure Analysis, and Maintenance Decision Making

- Identifying critical assets, systems, and equipment using risk-based prioritization
- Failure modes, failure mechanisms, functional failure, potential failure, and the P-F interval concept
- Applying Failure Modes and Effects Analysis principles to maintenance planning
- Defining maintenance tasks, monitoring points, intervention criteria, and escalation responsibilities

PRACTICAL APPLICATION OR DISCUSSION

Developing a criticality profile and failure-monitoring plan for selected equipment

DAY 03

Condition Monitoring Technologies and Data Interpretation

- Vibration analysis fundamentals for rotating equipment and machinery health assessment
- Thermography, ultrasound, oil and lubricant analysis, motor testing, and electrical condition monitoring
- Process data, performance monitoring, environmental conditions, and operating-context indicators
- Data collection methods, trend analysis, baseline development, alarm levels, and diagnostic confidence

PRACTICAL APPLICATION OR DISCUSSION

Interpreting sample condition-monitoring results and identifying appropriate maintenance actions

DAY 04

Integrating Predictive Maintenance into Work Management and Digital Systems

- Converting predictive maintenance findings into inspection, repair, corrective maintenance, and improvement work orders
- Maintenance planning, scheduling, shutdown coordination, spare-parts readiness, and resource allocation
- Using CMMS, EAM, sensor platforms, dashboards, and maintenance records to support decision making
- Data governance, data quality, reporting standards, cybersecurity awareness, and information ownership

PRACTICAL APPLICATION OR DISCUSSION

Designing an end-to-end predictive maintenance workflow from detection to work completion and verification

DAY 05

Performance Management, Implementation, and Continuous Improvement

- Predictive maintenance performance indicators: asset availability, planned work, repeat failures, response time, and condition-monitoring compliance
- Building management support, technical capability, roles, responsibilities, and governance structures
- Developing phased implementation roadmaps for sites, departments, facilities, or enterprise asset portfolios
- Managing change, stakeholder engagement, lessons learned, and continuous reliability improvement

FINAL WORKSHOP, ACTION PLAN, OR IMPLEMENTATION EXERCISE

Creating a 90-day predictive maintenance improvement plan with priorities, milestones, owners, measures, and review mechanisms

Register or Request More Information

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

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