

# INSPECTION AND PERFORMANCE EVALUATION OF ROTATING EQUIPMENT

## MCE020

### COURSE DESCRIPTION

In today's fast-paced industrial environment, ensuring the optimal performance and reliability of rotating equipment is crucial for operational success and safety. This professional training course provides participants with a comprehensive understanding of the inspection and performance evaluation processes for rotating equipment.

Participants will gain in-depth knowledge of the fundamental principles, safety protocols, and various types of rotating equipment, including pumps, compressors, turbines, and electric motors. The course is designed to equip attendees with advanced diagnostic and maintenance strategies through hands-on training and practical examples.

Throughout this training, participants will learn to identify and analyze key performance indicators (KPIs), conduct efficient inspections using visual, vibration, thermographic, and ultrasonic techniques, and perform root cause analyses to diagnose and rectify equipment failures. Furthermore, the course covers essential maintenance strategies, including preventive, predictive, and reliability-centered maintenance (RCM), ensuring participants can implement effective maintenance plans to enhance equipment longevity and performance.

By the end of this course, participants will be able to effectively inspect, evaluate, and maintain rotating equipment, leading to improved operational efficiency and reduced downtime.

### COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Understand the fundamental principles of rotating equipment.
- Perform safety inspections and adhere to safety protocols.
- Identify and evaluate different types of rotating equipment.
- Utilize various inspection techniques such as visual inspection, vibration analysis, thermography, and ultrasound inspection.
- Measure and analyze key performance indicators (KPIs) for rotating equipment.
- Conduct diagnostic techniques to determine the root cause of equipment failures.
- Implement maintenance strategies including preventive, predictive, and reliability-centered maintenance (RCM).

## WHO SHOULD ATTEND

- Maintenance Engineers
- Reliability Engineers
- Operations Managers
- Maintenance Technicians
- Plant Managers
- Mechanical Engineers

## COURSE DURATION

5 Working Days

## COURSE OUTLINES

### 1. Introduction to Rotating Equipment

- Overview of Rotating Equipment
  - Definition and examples (e.g., pumps, turbines, compressors, motors)
  - Importance in various industries
- Fundamentals of Rotating Equipment
  - Basic principles of operation
  - Key components and their functions
- Safety Considerations
  - Safety protocols and procedures
  - Personal protective equipment (PPE)

### 2. Types of Rotating Equipment

- Pumps
  - Types (centrifugal, positive displacement, etc.)
  - Common applications and performance parameters
- Compressors
  - Types (reciprocating, rotary, etc.)
  - Key performance indicators
- Turbines
  - Types (steam, gas, hydraulic, etc.)
  - Performance metrics
- Electric Motors
  - Types (AC, DC, induction, etc.)
  - Efficiency and performance evaluation

### 3. Inspection Techniques

- Visual Inspection
  - Identifying wear and tear
  - Recognizing signs of misalignment or imbalance
- Vibration Analysis
  - Basics of vibration measurement
  - Tools and techniques for vibration analysis
- Thermography
  - Principles of thermal imaging
  - Applications in detecting overheating components
- Ultrasound Inspection
  - Using ultrasonic devices to detect faults
  - Interpreting ultrasound data

### 4. Performance Evaluation

- Operational Parameters
  - Key performance indicators (KPIs) for rotating equipment
  - Methods for measuring and analyzing KPIs
- Efficiency Assessment
  - Calculating and interpreting efficiency metrics
  - Identifying factors affecting efficiency
- Condition Monitoring
  - Continuous vs. periodic monitoring
  - Technologies and tools for real-time condition monitoring

### 5. Diagnostic Techniques

- Root Cause Analysis
  - Techniques for identifying the root cause of failures
  - Case studies and practical examples
- Fault Diagnosis
  - Common faults and their symptoms
  - Diagnostic tools and methods
- Corrective Actions
  - Planning and implementing repairs
  - Preventive measures to avoid future issues

## 6. Maintenance Strategies

- Preventive Maintenance
  - Scheduled inspections and maintenance tasks
  - Benefits and limitations
- Predictive Maintenance
  - Using data and analytics for maintenance planning
  - Tools and technologies for predictive maintenance
- Reliability-Centered Maintenance (RCM)
  - Principles of RCM
  - Implementing RCM in an organization

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