BOOST
THE LEADING TRAINING PROVIDER

Maintenance & Reliability Management

Assessing and Improving Reliability of Rotating Equipment Machinery

Course Introduction

Reliable operation of the rotating equipment in any plant is its life blood. Engineers must have an integrated viewpoint focusing on it through design, operation and maintenance.

Rotating equipment.

This course comprehensively presents from such an integrated viewpoint state-of-the-art techniques and methodologies for improving reliability of rotating equipment. Topics include reliability basics; maintenance philosophies and strategies, their relationships to each other, and their effective application; machinery condition monitoring; machinery condition assessment and asset management; effective fault diagnosis techniques; failure mode and causal analysis; life-cycle strategies to promote increased reliability; reliability improvement program development and implementation including structure and personnel considerations; and business ramifications of reliability improvement.

lectures and workshop

The course will comprise lectures and workshop to maximize your benefits. Additionally, an optional "Question and Answer" period is included to provide you with opportunity to get expert answers on your specific questions.

Target Audience

- Facilities Engineer
- Facilities Engineering Manager
- Facilities Manager
- Facilities Specialist / Coordinator
- Health and Safety Engineer
- Maintenance Group Leader
- Maintenance Helper / Assistant
- Maintenance Manager
- Maintenance Superintendent
- Maintenance Supervisor

- Mechanical Reliability Engineer
- Network Reliability Engineer
- Operations and Maintenance Specialist
- Reliability Engineer

Learning Objectives

- To present the principles of Asset Management, and CBM.
- To present the key features for successful implementation of CBM
- To review problems, faults and their causes in Rotating Mechanical and Electrical Plant.
- To present the key features of Condition Monitoring Techniques for Rotating Mechanical Plant.
- To present the key features of Condition Monitoring Techniques for Electrical Machines and Drives.
- To present the principles of vibration monitoring, analysis and interpretation of vibration data.
- To present the principles of Motor Current Signature Analysis (MCSA), Analysis and interpretation of current spectra.
- To present the principles of Partial Discharge Monitoring to detect problems in High Voltage Stator Windings of Generators and Motors.
- To illustrate the application of the above CM Techniques via industrial case studies.
- To illustrate the importance of an integrated CM strategy for Rotating Plant.

Course Outline

- **01 DAY ONE**

  MODULE (01) RELIABILITY ENGINEERING

  - 1.1 Reliability basics
  - 1.2 Elements of world-class reliability
  - 1.3 Reliability prediction models

- 1.4 Traditional approach to reliability prediction
- 1.5 Failure mode and effect analysis
- 1.6 Machinery reliability assessment
- 1.7 Ascertaining the functionality and remaining life of rotating equipment

MODULE (02) MAINTENANCE METHODS AND STRATEGIES

- 2.1 Breakdown, preventive, predictive and proactive maintenance
- 2.2 Reliability-centered maintenance (RCM)
- 2.3 Precision maintenance
- 2.4 Computerized maintenance management systems (CMMS)

- **02 DAY TWO**

MODULE (03) RELIABILITY IMPROVEMENT PROGRAM DEVELOPMENT AND IMPLEMENTION

- 3.1 Program definition and development: structure, objectives, impact on business
- 3.2 Reliability action teams: structure, training, mandate, and resources
- 3.3 Identify and rank reliability deficiencies and associated lost production costs
- 3.4 Critical poor performers (bad actors) identification and tracking

MODULE (04) ECONOMICS OF MACHINERY FAILURES AND RELIABILITY

- 4.1 Improvement
- 4.2 Cost impact of machinery failure
- 4.3 Justification and economic evaluation of reliability improvement projects
- 4.4 Financial concepts: capital assets, time value of money, life cycle costs and risk
- 4.5 Life cycle costs methodology

MODULE (05) EFFECTIVENESS OF RELIABILITY DEFICIENCY CORRECTIONS

- 5.1 Reliability performance indicators
- 5.2 MTBF, MTTR 5.3 Lost production cost
- 5.4 Direct failure information 5.5 Reporting

- **03 DAY THREE**

MODULE (06) VIBRATION IN ROTATING MACHINERY

- 6.1 Vibration fundamentals
- 6.2 Vibration in condition monitoring
- 6.3 Vibration monitoring and analysis methods – benefits and limitations
- 6.7 RMS broad-band vibration meters

- 6.8 Shock-pulse technology
- 6.9 Diagnostic screening technology
- 6.10 Narrow band vibration analysis
- 6.11 Automated diagnostic system for vibration analysis
- 6.12 Intelligent smart machines
- 6.13 Data interpretation

MODULE (07) INDUSTRIAL LUBRICATION

- 7.1 Lubrication theory and practice
- 7.2 Plant lubrication systems and programs
- 7.3 Wear particle analysis technology
- 7.4 Bearing failures – Detection, diagnosis and prevention guidelines and tips

- **04 DAY FOUR**

MODULE (08) MACHINERY COMPONENT FAILURE AND ANALYSIS

- 8.1 Common causes of component failures: bearings, seals, shafts, couplings, controls
- 8.2 Design, application, materials, and installation factors
- 8.3 Operating practices
- 8.4 Maintenance practices and quality
- 8.5 Wear failure models
- 8.6 Troubleshooting guidelines
- 8.7 Metallurgical failure analysis methodology
- 8.8 Reliability of standby equipment
- 8.9 Periodic exercising program
- 8.10 Best industry practices, guidelines and tips.
- 8.11 Impact of equipment standby practices on reliability and maintenance costs

MODULE (09) FAULT CAUSES, DETECTION AND DIAGNOSIS

- 9.1 Failure evolution process
- 9.2 Bases for the detection of faults in rotating machinery
- 9.3 Principles of rotor dynamics and balancing
- 9.4 Mass unbalance
- 9.10 Bent shafts – thermal distortion, large unbalance force
- 9.11 Cracked shafts – vibration caused by fatigue-induced cracks
- 9.12 Shaft misalignment
- 9.13 Bearing lubrication, misalignment, and rubbing
- 9.14 Excessive forces and moments by connected piping
- 9.15 Equipment base plate grouting

• 05 DAY FIVE

MODULE (10) MACHINERY CONDITIONS MONITORING

◦ 10.1 On-line condition monitoring strategies

◦ 10.2 Protection systems vs. diagnostic systems

◦ 10.3 Parameters measured and measurement locations

◦ 10.4 Typical field data collection processes and systems

◦ 10.5 Remote monitoring and diagnostics

◦ 10.6 Expert systems – smart machines

◦ 10.7 Enhancements to CBM technologies

◦ 10.8 Interpretation of measurements, trend analysis and diagnostics

MODULE (11) MACHINERY FAILURE ANALYSIS AND PREVENTION

◦ 11.1 Troubleshooting rotating machinery

◦ 11.2 Failure mode and effect analysis

◦ 11.3 Failure investigation process

◦ 11.4 Root cause failure analysis methods

◦ 11.5 Corrective action: continue, repair, redesign, replace

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 16, 2025	June 20, 2025	5 days	4250.00 $	UAE - Dubai
Sept. 8, 2025	Sept. 12, 2025	5 days	4250.00 $	UAE - Dubai
Nov. 3, 2025	Nov. 7, 2025	5 days	4950.00 $	Turkey - Istanbul