€TRAINING

Vibration Monitoring and Fault Diagnosis for Machinery Reliability

24 - 28 March 2025
London (UK)

Vibration Monitoring and Fault Diagnosis for Machinery Reliability

REF: E380 DATE: 24 - 28 March 2025 Venue: London (UK) - Fee: 6375 Euro

Introduction:

Vibration monitoring and fault diagnosis are critical techniques for ensuring machinery reliability by detecting abnormalities early. These methods analyze vibration patterns to identify potential faults, such as misalignment, imbalance, or wear, enabling proactive maintenance to prevent failures and optimize equipment performance. This training program offers comprehensive instruction on the principles and practices of vibration management in industrial machinery. It covers techniques for shaft alignment and dynamic balancing to optimize machinery performance and minimize downtime.

Program Objectives:

At the end of this program, participants will be able to:

- Explore the fundamental principles of vibration monitoring and its significance in assessing machinery health.
- Apply vibration analysis techniques such as FFT and time waveform analysis for fault detection and diagnosis.
- Utilize shaft alignment methods to improve machinery reliability and reduce vibration.
- Implement dynamic balancing techniques to minimize vibration in rotating machinery.
- Detect and diagnose machinery faults using vibration signals and develop corrective actions based on the findings.

Targeted Audience:

- Operation and Maintenance Operators.
- Supervisors & Technicians.
- Facility and Utility Engineers.
- Technical Professionals dealing with condition monitoring, reliability, and integrity analysis.

Program Outlines:

Unit 1:

Fundamentals of Vibration Monitoring:

- Introduction to vibration monitoring and its significance in machinery health assessment.

- Understanding vibration parameters such as amplitude, frequency, and phase.
- Overview of vibration sensors and data collection techniques.
- Fundamentals of vibration analysis for detecting machinery faults.
- Importance of vibration monitoring in predictive maintenance strategies.

Unit 2:

Vibration Analysis Techniques:

- In-depth exploration of vibration analysis techniques, including FFT analysis and time waveform analysis.
- Understanding spectral analysis and resonance identification.
- Vibration analysis software for data interpretation and fault diagnosis.
- Interpretation of vibration analysis results for proactive maintenance decision-making.

Unit 3:

Shaft Alignment Principles and Practices:

- Principles of shaft alignment and its importance in machinery reliability.
- Techniques for shaft alignment, including reverse indicator, dial indicator, and laser alignment methods.
- Common alignment errors and their impact on machinery performance.
- Strategies for optimizing shaft alignment to minimize vibration and extend equipment lifespan.

Unit 4:

Dynamic Balancing Methods:

- Understanding the principles of dynamic balancing and its role in reducing vibration levels.
- Techniques for identifying unbalance in rotating machinery.
- Introduction to single-plane and two-plane balancing methods.

Unit 5:

Vibration-Based Fault Detection and Diagnosis:

- Introduction to vibration-based fault detection methods and their significance in predictive maintenance.

- Identifying common machinery faults such as misalignment, unbalance, bearing defects, and looseness using vibration signals.
- Analyzing fault-specific vibration patterns and their correlation with machine condition.
- How to apply diagnostic tools and techniques to assess the severity of detected faults.
- Developing corrective actions based on vibration analysis findings to prevent equipment failure.