MERCURY

Introduction to Machinery Vibration Analysis Category #1

09 - 13 Sep 2024
London (UK)

Introduction to Machinery Vibration Analysis Category #1

Ref.: 15645_318491 **Date:** 09 - 13 Sep 2024 **Location:** London (UK) **Fees:** 5800 **Euro**

Introduction:

In this Introduction to Machinery Vibration Analysis Category #1 course of industrial maintenance and reliability, understanding machinery vibration is crucial for ensuring optimal performance and longevity of equipment. Vibration analysis is a cornerstone in predictive maintenance strategies, allowing engineers and technicians to diagnose potential issues before they escalate into costly failures.

Throughout this course, we will delve into the fundamentals of vibration analysis, starting with the basics of vibration theory and its application in diagnosing machinery health. From understanding the different types of vibrations to learning how to interpret vibration data using advanced analysis techniques, this course aims to equip you with the essential knowledge and skills needed to monitor and maintain machinery effectively.

Whether you're new to the field or looking to deepen your expertise, join us as we explore the fascinating world of machinery vibration analysis and its pivotal role in ensuring operational efficiency and reliability in industrial settings.

Targeted Groups:

- Maintenance Engineers and Technicians
- Reliability Engineers
- Condition Monitoring Specialists
- Mechanical Engineers
- Plant Managers and Supervisors
- Predictive Maintenance Professionals
- Industrial Engineers
- Equipment Diagnostics Specialists
- Asset Managers
- Operations and Maintenance Personnel

Course Objectives:

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

- Understand the basic principles and theories of machinery vibration.
- Learn how to perform and interpret vibration measurements.
- Identify different types of machinery faults through vibration analysis.
- Gain proficiency in using vibration analysis tools and techniques.
- Apply predictive maintenance strategies to enhance machinery reliability and performance.
- Develop skills in assessing vibration severity and determining appropriate corrective actions.
- Explore advanced topics such as frequency analysis and resonance in machinery.
- Understand the role of vibration analysis in optimizing maintenance schedules and reducing downtime.
- Gain insights into the economic benefits of predictive maintenance through vibration analysis.

- Enhance troubleshooting abilities by correlating vibration data with machinery performance.

Targeted Competencies:

- Understanding Vibration Fundamentals
- Performing Basic Vibration Measurements
- Interpreting Vibration Spectra
- Identifying Common Machinery Faults through Vibration Analysis
- Implementing Predictive Maintenance Strategies

Course Content:

Unit 1: Fundamentals of Machinery Vibration:

- Introduction to vibration terminology and concepts.
- Understanding the physics of vibration and its sources in machinery.
- Types of vibrations: rotational, linear, torsional, and their significance.
- Relationship between vibration and machine health.
- Importance of vibration measurement and analysis in predictive maintenance.

Unit 2: Vibration Measurement Techniques:

- Overview of vibration measurement instruments: accelerometers, velocity sensors, and displacement probes.
- Hands-on training in using vibration measurement equipment.
- Techniques for mounting sensors and ensuring accurate data collection.
- Data acquisition basics: sampling rates, frequency ranges, and signal processing.
- Practical exercises in conducting vibration measurements on various machinery types.

Unit 3: Vibration Signal Analysis:

- Introduction to vibration signal analysis software and tools.
- Frequency domain analysis: Fourier transform and spectrum analysis.
- Time domain analysis techniques: waveform analysis, peak detection.
- Amplitude and phase analysis: understanding amplitude modulation and phase relationships.
- Case studies and simulations for interpreting vibration spectra.

Unit 4: Machinery Fault Diagnosis:

- Common machinery faults detectable through vibration analysis: imbalance, misalignment, bearing defects, and looseness.
- Pattern recognition in vibration spectra for fault identification.
- Diagnostic techniques: trend analysis, waterfall plots, envelope analysis.
- Root cause analysis based on vibration signatures.
- Hands-on exercises in diagnosing simulated faults using real-world data.

Unit 5: Predictive Maintenance Strategies:

- Introduction to predictive maintenance PdM and its benefits.
- Role of vibration analysis in PdM strategies: condition monitoring and predictive analytics.
- Establishing vibration-based maintenance schedules and thresholds.
- Integration with other predictive technologies: infrared thermography, oil analysis.

- Developing actionable maintenance recommendations based on vibration analysis results.

Registration form on the :
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