

€ TRAINING

Dynamic Machinery Management





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Introduction:

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:

- Understand the measurement and characteristics of vibration signals, as well as the methods for storing and representing vibration data.
- Gain comprehensive knowledge of vibration-based fault detection and diagnostic techniques, with practical implementation skills.
- Perform detailed and reliable diagnoses for various common machinery and component types.
- Comprehend the principles and practices of balancing routine rotating machines and achieve high-quality balance using vibration-based methods.
- Recognize the limitations of vibration monitoring systems and approaches, and learn strategies to avoid pitfalls for more effective results.

Targeted Audience:

- Operation and Maintenance Operators.
- Supervisors & Technicians.
- Facility Engineers.
- Utility Engineers.
- Anyone requiring a working level knowledge of rotating equipment & compressors.
- 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.
- Application of vibration analysis software for data interpretation and fault diagnosis.
- Case studies demonstrating the practical application of vibration analysis techniques.
- 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.
- Practical alignment exercises to reinforce alignment principles.
- 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.
- Application of balancing techniques to improve machinery performance and reliability.

Unit 5:

Case Studies and Practical Applications:

- Analysis of real-world case studies highlighting the importance of vibration monitoring, analysis, alignment, and balancing.
- Practical exercises and simulations to apply learned concepts in real-world scenarios.
- Discussion of best practices and lessons learned from industry experiences.
- Interactive workshops for troubleshooting and problem-solving in vibration-related issues.