**Training Title**

# MACHINERY VIBRATION ANALYSIS

**Training Duration**

**5 days**

**Training Dates & Venue**

| | | | | | |
|---|---|---|---|---|---|
| REF ME087 | Machinery Vibration Analysis | 5 | 27 – 31 May 2024 | $6,500 | London, UK |

**Training will be held at any of the 5-star hotels. The exact venue will be informed once finalized.**

**Training Fees**

- **$6,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch**

**Training Certificate**

**Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.**

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

**The Vibration Institute vibration analysis certification program is the benchmark and is recognized as one of the highest standards of industry knowledge and competence among professionals in the field. Employers and clients seek the most qualified and knowledgeable professionals in an increasingly competitive marketplace. Vibration Institute analysis certification programs were accredited by the American National Standards Institute in March 2010. ANSI is the premier organization coordinating national and international standards implementation.**

**Accreditation by ANSI ensures that the institute's vibration analysis certification program and process is fair, and consistent and maintains the highest standards to assess the qualification of professionals in a non-subjective manner. Certified vibration analysis, ensures technical competence and a measurement for advancing careers. For employers, certification validates employees' skills and knowledge that ultimately result in better service, support, and customer satisfaction grounded in safe and effective practices.**

**The four-category vibration analysis certification program offered by the Vibration Institute adheres to ISO 18436-2 and is enhanced by a job-task analysis conducted by the Vibration Institute certification committee.**

**Category 1 Vibration Analysis is qualified to perform a range of single channel machinery vibration condition monitoring and diagnostics activities including data acquisition on predetermined routes, machine steady state testing to predefined procedures.**

**TRAINING OBJECTIVES**

- **Understand the basics of vibration measurement**
- **Demonstrate the basics of signal analysis**



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- **Understand measurement and the characteristics of vibration signals**
- **Use data acquisition equipment for vibration signals**
- **Apply vibration analysis for different machinery faults**
- **Apply specific techniques for pumps, compressors, engines, turbines and motors**
- **Apply vibration-based fault detection and diagnostic techniques**
- **Diagnose machinery-related problems with vibration analysis techniques**
- **Apply advanced signal processing techniques and tools to vibration analysis**
- **Detect, locate, and diagnose faults in rotating and reciprocating machinery using vibration analysis techniques**
- **Identify conditions of resonance and be able to rectify these problems**

## WHO SHOULD ATTEND?

**Any plant personnel who are involved in direct maintenance, troubleshooting, or rotating machinery and want to enhance knowledge in the best maintenance program and continuous improvement**

## TRAINING METHODOLOGY:

**A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your questions and to share in the development of the right answers using your analysis and experiences. Tests of multiple-choice type will be made available daily to examine the effectiveness of delivering the course.**
**Very useful Course Materials will be given.**

- **30% Lectures**
- **30% Workshops and work presentation**
- **20% Group Work& Practical Exercises**
- **20% Videos& General Discussions**



## DAILY OUTLINE

1. **Understanding the Basic Theory Behind Vibration Analysis Vibration Sources of Vibration**
   - **Sources of Vibration**
   - **Effects of Vibration**
   - **Uses of Vibration**
   - **Measurement and Analysis**
   - **Review**
2. **Basic Machinery Vibration**
   - **The Physical Nature of Vibration**



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- Vibration Measurement
- Vibratory Motion
- Measures
- Conversions
- Vibration Analysis
- Excitation –resonance frequency
- Natural frequencies, and Critical speeds

3. Data Collection
   - Physical Observations
   - Periodic and Continuous Data Collection
   - Vibration Instruments
   - Computer Software
4. Machine Characteristics
   - Machine knowledge
   - Sources of Vibration
   - Bearings
   - Centrifugal Machines
   - Gears and Generators
   - Motors and Generations
   - Process Machines
5. Vibration Instruments
   - Data Displays
   - Meters- amplitude
   - Oscilloscopes and phase
   - Data Collectors and Analysis- amplitude, frequency, and phase
   - Virtual Instruments
6. Vibration Testing
   - Periodic monitoring
   - Machine analysis
   - Acceptance testing
   - Design Characteristics
   - Natural frequencies
   - Critical Speeds
7. Basic Analysis
   - Introduction
   - Spectrum analysis
   - Time waveform shape
   - Analysis terminology
   - Common machine faults
   - Closure
8. Vibration Severity
   - Machinery knowledge
   - Introduction
   - Bearing housing evaluation
   - Shaft vibrations





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- **Gears and bearing**

**NOTE:**
**Pre-& Post Tests will be conducted**
**Case Studies, Group Exercises, Group Discussions, Last Day Reviews, and assessments will be carried out.**





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