

**Training Title**

**MACHINERY VIBRATION ANALYSIS**

**Training Duration**

5 days

**Training Dates & Venue**

REF			17 – 21		Abu Dhabi,
ME087	Machinery Vibration Analysis	5	June	\$4,250	UAE

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

**Training Fees**

- 4,250 US\$ 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 recognized as one of the highest standards of industry knowledge and competence among professionals in the field. In an increasingly competitive market place, employers and clients seek the most qualified and knowledgeable professionals.

Vibration institute analysis certification programs was accredited by the American National Standards Institute in March 2010. ANSI is the premier organization that coordinates the implementation of national and international standards. Accreditation by ANSI ensures that the institute's vibration analysis certification program and process is fair, consistent and maintains the highest standards to assess the qualification of professional in a non-subjective manner. For certified vibration analysis, it 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. There are four-category vibration analysis certification program offered by vibration institute that adheres to ISO 18436-2 and is enhanced by a job-task analysis conducted by the vibration institute certification committee.

Category 1 Vibration Analysis are 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
- 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 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 motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis 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**

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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
  - Vibration Measurement
  - Vibratory Motion

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- 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
  - Gears and bearing

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Case Studies, Group Discussions, Last Day Review, Assessments will be carried out.

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