

Training Title:

VIBRATION ANALYSIS & CONDITION MONITORING

Training Duration:

5 Days

Training Venue and Dates

REF					
ME053	Vibration Analysis & Condition Monitoring	5	22-26 July	\$4,250	Dubai, UAE

In any of the 5 star hotel. Exact venue will be informed soon.

Training Fees

- 4,250 US\$ per participant for Public Training including Course Materials/Handouts, Tea/Coffee, Refreshments & International Buffet Lunch

Training Certificate

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

TRAINING DESCRIPTION

This course provides a detailed examination of the detection, location and diagnosis of faults in rotating and reciprocating machinery using vibration analysis. The basics and underlying physics of vibration signals are first examined. The acquisition and processing of signals is then reviewed followed by a discussion of machinery fault diagnosis using vibration analysis. Hereafter the important issue of rectifying faults that have been identified using vibration analysis is covered. The course is concluded by a review of the other techniques of predictive maintenance such as oil and particle analysis, ultrasound and infrared thermography. The latest approaches and equipment used together with current research techniques in vibration analysis are also highlighted in the course.

OBJECTIVES

- Calibrate & maintain VMS, TMS & CMS Systems and carry out machinery failure analysis & condition monitoring
- 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
- Apply allied predictive techniques such as oil analysis, thermography, ultrasonics and performance evaluation

WHO SHOULD ATTEND?

- Foreman / Snr Foreman / Supervisor / Engineer
- Instrumentation and Control Engineers
- Maintenance Engineers
- Control Technicians
- Electrical Engineers
- Electricians
- Maintenance Engineers and technicians

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. The delegates will also be encouraged to raise their own questions and to share in the development of the right answers using their own analysis and experiences.

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

COURSE OUTLINE

DAY 1

VIBRATION ANALYSIS

Introduction about condition monitoring systems

Thermography

Oil analysis

Ultrasound

Industrial video scope system

Motor view

Vibration

www.definettraining.com

DAY 2

What Is Vibration And How Can It Be Used To Evaluate Machinery Condition ?

Introduction

What Is Vibration Frequency And How Does It Relate To A Time Wave Form ?

What Is Vibration Displacement?

What Is Vibration Velocity?

What Is Vibration Acceleration?

What Is Vibration Phase?
What Is The Vibration Spectrum?
Difference between RMS, Peak and Peak-Peak Vibration Amplitude?
When To Use Displacement, Velocity Or Acceleration?
How Much Is Too Much Vibration?
What Is Overall Vibration?
Understanding Phase and Its Application?
How to Make Phase Measurements?
Using Phase Analysis In Vibration Diagnostics?

DAY 3

Overview of Vibration Transducer and How to Properly Select Them

Introduction

Types Of Vibration Transducers And Their Optimum Applications

Accelerometers

Velocity Pickups

Noncontact Eddy Current Displacement Probes

Shaft Contact Displacement Probes

Shaft Sticks

Shaft Riders

Selection Criteria

Mounting Of Transducer

Transducer Mounting Application

DAY 4

Proven Method for Specifying Spectral Band Levels And Frequencies Using Today'S Predictive Maintenance Software System

Brief Review Problems Detectable By Vibration Analysis

Specification Of Overall Vibration Alarm Bands For Various Machine Types

How To Specify Spectral Alarm Bands For Various Machine Types And Configurations

Examples Of Various Machines With Spectral Alarm Bands Specified For Them

Common Pitfalls in Everyday Vibration Measurements

Introduction

Choosing Measurements Location

Machine And Point Identification

Measurement Parameters

Instrument Selection, Setup, And Condition

Measurements Techniques

Transducer Mounting And Probes

Effect Of Transducer Mounting On Vibration Measurements

Digital Signal Processing

Introduction

Related Time waveform Length And Frequency Band Width To Sampling Rate And Sample Size

Choose The Correct Analysis Window For Each Vibration Analysis Opportunity

Recognize Limitation Of Digital Signal Processing

DAY 5

Introduction to Vibration Signature Analysis and How to Diagnose Machine Operating Condition
Mass Unbalance
Eccentric Rotors
Bent Shaft
Misalignment
Mechanical Looseness
Practical Case study
Tracking Of Rolling Element Bearings Failure Stage Using Vibration Signature Analysis
Journal Bearings Failure
Gear Problem Detection
Electrical Problem Detection
Belt Drive Problem
Resonance Problem
Hydraulic And Aerodynamic Forces Problem
Rubbing
Practical case study

NOTE:

Case Studies, Individual & Group Exercises, Project works (making in to groups), Role plays, Group Discussions, Day Review & Assessments will be carried out.

TRAINING OUTCOME

- Upon completing this course, participants will be able to:
- 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
- Apply allied predictive techniques such as oil analysis, thermography, ultrasonics and performance evaluation Discussions and Last Day Assessments will be carried out.

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