

Vibration Analysis

Course Objectives:

The Vibration Analysis Level I course is intended for personnel who are new to vibration monitoring and analysis, and for personnel who have limited vibration analysis experience. The course focuses on periodic, single channel data collection and analysis for condition based maintenance programs. A foundation is established for in-depth understanding of spectrum and waveform relationships. This is the ideal starting place for new vibration analysts, people collecting vibration data, and those who want a better understanding of vibration analysis and condition monitoring. You will come away from this course with a very good understanding of the fundamentals; you will understand how to take good measurements (and understand the importance of repeatability); and you will be ready to begin analysing vibration spectra.

Detailed Topic List:

Maintenance Practices

- ✚ Breakdown maintenance
- ✚ Preventive (calendar based) maintenance
- ✚ Predictive (condition based) maintenance
- ✚ Proactive (reliability centered) maintenance

Condition monitoring

- ✚ Acoustic emission (ultrasound):
- ✚ Thermography
- ✚ Oil analysis
- ✚ Wear particle analysis
- ✚ Motor testing

Principles of vibration

- ✚ Introduction to vibration measurement
- ✚ An introduction to the time waveform
- ✚ An introduction to the spectrum
- ✚ An introduction to forcing frequencies
- ✚ Explaining the different vibration units
- ✚ A brief introduction to phase

Data acquisition

- ✚ A quick review of data acquisition
- ✚ How do we measure vibration?
- ✚ Where to place the sensor on the machine
- ✚ Understanding axial and radial readings
- ✚ Mounting the accelerometer
- ✚ Naming conventions
- ✚ What are "routes" and how to create?

Signal processing

- ✚ A quick tour of your analyser
- ✚ Spectral averaging

Vibration analysis

- ✚ The spectrum analysis process
- ✚ What is resonance – a quick introduction
- ✚ Diagnosing common fault conditions
 - ✓ *Unbalance*

- ✓ *Misalignment*
- ✓ *Looseness*
- ✓ *Rolling element bearing wear*
- ✓ *Common electric motor faults*
- ✓ *Gearbox faults*

Setting alarm limits

- ✚ The ISO standard for setting alarms
- ✚ Band alarms
- ✚ Envelope alarms

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Course Duration

- The course consists of three full days of training & 1-hour exam

Hours

- 9.00 am to 4.00 pm (Days 1-3)
- Exam: 1 hour - end of Day 3

Who should attend

- ☞ Maintenance Professionals
- ☞ Plant/Rigs Supervisors
- ☞ R & D Personnel
- ☞ QA/QC Supervisors
- ☞ Equipment designers
- ☞ HVAC Engineers
- ☞ Plant Technicians
- ☞ Vibration Engineer
- ☞ Inst. Technicians
- ☞ Maintenance Technicians
- ☞ Equipment Operators
- ☞ Reliability Engineers

- ☞ Industrial Engineers
- ☞ Operations Managers

Practical Applications of Training Course

This course provides unique opportunities to study Vibration principles in a way that goes beyond the textbook and provides real-world applications.



Mega Engineering Solution

Phone: 051-8897375, 0333-5486697