Vibration Analysis CAT II

Introduction:

The CAT-II course is intended for people who have mastered the basics but who need to be able to take good data (and decide how the data collector should be set up), analyze a range of fault conditions, and understand balancing and alignment. We teach you to test machines correctly, how to diagnose faults accurately, perform additional diagnostic tests for verification, how to set vibration alarm limits, and how to correct certain types of faults. You need to understand what your analyzer settings mean so that you can take the best measurements. You also need to understand why the vibration signatures change the way they do and how to use time waveform analysis and phase analysis to verify the fault condition. Mobius makes learning about vibration analysis unique. We use 3D animations, Flash simulations, and numerous software simulators that completely demystify vibration analysis. While vibration training courses have traditionally been very theoretical, difficult to understand, (and boring), you will be captivated by the Mobius Training methods, and you will enjoy our practical approach. You will take away skills that you can immediately apply to your job, and you will truly understand what you are doing.

Objectives:

You will come away from the course with a solid understanding of:

- How a well-designed program and a reliability centered maintenance approach improve the OEE and therefore the bottom line
- The condition monitoring technologies: acoustic emission, infrared analysis (thermography), oil analysis, wear particle analysis, & motor testing via supplementary training
- How machines work; via supplementary selfstudy using the "Equipment Knowledge" section
- How to select the correct measurement location and axis, and collect good, repeatable measurements
- What the Fmax, resolution, averaging and other analyzer settings mean, and how to select the optimum settings for a wide variety of machine types
- How to analyze vibration spectra, time waveforms, envelope (demodulation), and phase measurements
- How to diagnose: unbalance, eccentricity, misalignment, bent shaft, cocked bearing, looseness, rolling element bearings faults, journal bearing faults, gearbox faults, resonance, and other conditions
- How to set alarm limits manually and with statistics
- How to balance and align a machine, and correct a resonance condition

Who Should Attend?

This course is suitable for maintenance, reliability, process, control and instrumentation personnel who are willing to gain, improve and/or update their knowledge and skills of practical aspects of machinery vibration monitoring, analysis and predictive maintenance.

Course Outline:

- Review of maintenance practices
- Review of condition monitoring technologies
- Principles of vibration; Review of basics, waveform, spectrum (FFT), phase and orbits
- Understanding signals: modulation, beating, sum/difference
- Data acquisition

- Signal processing
- Vibration spectrum analysis
- An introduction to time waveform analysis
- An introduction to orbit analysis
- Phase analysis: bubble diagrams and ODS
- Enveloping (demodulation), shock pulse, spike energy, PeakVue™
- Fault analysis
- Equipment testing and diagnostics including impact testing (bump tests) and phase analysis
- Corrective action
- Running a successful condition monitoring program
- Acceptance testing
- Review of ISO standards