MAINTENANCE TROUBLESHOOTING INTERNATIONAL LLC

VMA-503

Hands-On Training Center: 2860 Ogletown Road, Newark, DE 19711
Corporate Offices & Mailing Address: 2917 Cheshire Road Wilmington, DE 19810
Phone/TXT: 302.593.2698 (Frank) Email: Frank@mtroubleshooting.com
Website: www.mtroubleshooting.com

VMA-503 VIBRATION MEASUREMENT, VIBRATION ANALYSIS AND PdM MONITORING

A solid course in vibration analysis and condition monitoring for the millwright, mechanic, maintenance technician, maintenance engineer, or maintenance manager involved in building or industrial maintenance. Learn how to monitor the condition of rotating machinery (and other critical assets), the importance of improved reliability, and how the vibration can be successfully measured and analyzed to provide an early warning of a wide range of fault conditions. You will come away as with knowledge that can be used operate any vibration instrument no matter who the manufacturer. You are invited to bring your own vibration equipment or use ours. When you complete the training you will know enough to make a valuable contribution to an existing program; be in a position to start a new program; determine if you should implement a program at your site; or better understand the program that exists in your plant. If you are contemplating purchase of vibration equipment, this course will give you the information needed to make a wise choice.

I. BASICS OF VIBRATION

- What is vibration — What causes vibration
- Characteristics of vibration
- Frequency — Displacement — Velocity —
- Acceleration — Phase — Acoustical emission
- Other Characteristics
- Forced vibration, Free vibration, Natural frequency, Resonant frequency, Critical speed
- Measurement units
- Peak-to-peak — in/sec peak — RMS
- Conversion of vibration measurements
- Significance of vibration characteristics
- Information provided by vibration frequency
- Information provided by vibration amplitude
- When to use velocity measurement
- When to use displacement measurement
- When to use acceleration measurement
- Information provided by phase
- Assessing vibration severity
- How much vibration is too much
- General vibration severity chart
- Acoustical emission bearing failure chart

II. VIBRATION MEASUREMENT

- Seismic velocity pickups (moving coil)
- Theory of operation — Characteristics —
- Magnetic interference
- Accelerometers
- Non-contact (Proximity) transducers
- Theory of operation — Installation
- Mounting of transducers
- Seismic velocity pickups and accelerometers
- Stud mounted — Epoxy mounted — Handheld without a probe — Hand-held with a probe — Magnetic holder — Vice-grip pliers — Shaft stick
- Guidelines for transducer selection
- Selecting transducers
- Mechanical characteristic of the machine
- Considering measurement parameters
- Measurement parameters
- Frequency range

III. DATA ACQUISITION

- What is vibration analysis
- Machine design and operating characteristics
- Machine characteristics
- Purpose of measurement
- Selection of measurement parameters
- Measurement positions and directions
- Selection of vibration measurement instruments
- Vibration meters - features
- Vibration analyzers - features
- Selection of measurement transducers
- Determination of data required
- Taking measurements
- Things to consider
- Common types of measurements
- Taking waveform measurements
- Use of filtering
- Long and short time samples
- Measuring frequency
- Setting up a PdM program that works

IV. DATA INTERPRETATION

- General analysis procedures
- Diagnosing machinery vibration
- Vibration due to unbalance
- Vibration due to misalignment
- Vibration due to eccentricity
- Vibration due to faulty anti-friction bearings
- Vibration due to faulty sleeve bearings (plain bearings)
- Vibration due to mechanical looseness
- Vibration due to drive belts
- Vibration due to gear problems
- Vibration due to electrical faults
- Vibration due to resonance
- Vibration due to aerodynamic and hydraulic forces
- Vibration due to reciprocating forces
- Vibration due to rubbing
- Beat vibration
- Use of strobe light and phase for diagnosis
- Background vibration

CLASS FORMATS AVAILABLE

- ☑ **MTI Hands-On Center $1295/person**
- ☐ **ZOOM Interactive (Not offered)**
- ☑ **On-Site (Your Location) Ask for Quote**

Quick Quote Available in 48 hrs.

CLASS DURATION

3-days, 22.5 hours of instruction
60% Hands-On

CLASS SUPPLIES

Vibration instruments are supplied to use in class but attendees are allowed to bring their own instruments to learn to use them on our test equipment.

Class Details: Each student will receive class books, work activity sheets, self-test progress evaluations, as well as questions from the instructor to make sure they understand the material presented. It is expected that an attendee will leave the class with the basic knowledge of the subject and possess new found skills to better equip them when they return to their job. A certificate suitable for framing will be issued to each attendee who successfully completes the course. Call, email or check the website for the next time this course is scheduled at the MTI training center. On-site sessions? Request a quick 48-hour turnaround quote. Revised: 01/07/2021