



Work Identification

WI212

Vibration Analysis II – ISO Category III

Recommended for

Plant personnel requiring a comprehensive understanding of vibration FFT and diagnostic techniques used to perform rotor dynamics analysis for increased performance of rotating machinery; including machinery specialists, predictive maintenance technicians, reliability engineers, and advanced mechanics.

Course objective

At the end of this course, participants will be able to better refine a condition monitoring program with diagnostic techniques that improve the performance of rotating machinery (both roller and sleeve bearing machinery). Participants will be able to diagnose several malfunctions, from common to moderately severe, and be able to make recommendations for corrective action. In addition, participants will be able to enhance condition monitoring programs with advanced measurement techniques, such as acceleration enveloping and SEE™ Technology.

Course description

A comprehensive survey and in-depth study of vibration spectrum analysis and related condition monitoring techniques used to analyze rotating machinery, and to detect and correct machinery malfunctions. An overview of rotor dynamics is presented, along with the study of severe, but less common, machinery problems that frequently lead to catastrophic failure. Sleeve bearing monitoring and analysis is discussed along with common problems. An overview of acceleration enveloping and SEE Technology is also presented.

- Brief review of Vibration Analysis I course topics
 - Vibration instruments and sensors
 - Evaluating machinery condition with vibration analysis
 - Analog vs. digital overall vibration measurements
 - Spike energy, high frequency demodulation (HFD), and shock pulse techniques
 - Common pitfalls in vibration measurements
 - Time waveform and conversion to FFT spectrum
- Proper use of vibration severity charts
- Phase analysis techniques

- Concentrated vibration spectrum analysis for detecting 40 machinery problems using the Illustrated Vibration Diagnostic Chart
 - Mass unbalance, eccentric rotors, and bent shafts
 - Misalignment and coupling problems
 - Mechanical looseness – 3 distinctly different types
 - Balance resonance problems
 - Rotor radial rubs and sleeve bearing problems
 - Track rolling bearing condition using spectrum analysis
 - Flow-induced vibration (cavitation, surge, starvation)
 - Gear problems (wear, excessive backlash, eccentricity, tooth misalignment, cracked/broken teeth, hunting tooth, assembly phase problems)
 - Monitoring problems in AC and DC motors
 - Belt-drive and beat vibration problems
 - Soft foot and distorted frame problems
- Proven analysis procedure using the Illustrated Vibration Diagnostic Chart, including examples
- High frequency enveloping and demodulation spectral analysis. What is SEE Technology? How are these techniques used to detect problems with rolling element bearings, gears, lubrication, and contamination
- Real-world case histories for each of the problems within the Illustrated Vibration Diagnostic Chart

Prerequisites

Six to 12 months full-time condition monitoring program experience; SKF course Vibration Analysis I (WI211) or commensurate field experience; knowledge of basic sensor and monitoring instrumentation.

2009 course schedule

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| Jan. 27–30 | Charlotte, NC |
| March 3–6 | San Diego, CA |
| March 24–27 | Charlotte, NC |
| March 31–April 3 | San Francisco, CA |
| April 28–May 1 | Dallas, TX |
| May 12–15 | Denver, CO |
| June 16–19 | Myrtle Beach, SC |
| June 23–26 | Seattle, WA |
| July 21–24 | Myrtle Beach, SC |
| Aug. 18–21 | Myrtle Beach, SC |
| Sept. 22–25 | Cincinnati, OH |
| Oct. 13–16 | Dallas, TX |
| Nov. 3–6 | Charlotte, NC |
| Nov. 17–20 | San Diego, CA |
| Dec. 15–18 | Charlotte, NC |

2009 tuition

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| Public classes | \$1,495 |
| On-site | Tuition on request based on number of students |

3.5 days – optional certification test on day 4

A written examination is available for this course. Test Fee – \$250 per person. Successful completion of the written exam results in Level II Vibration Analysis Certification.

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