PUBLIC SEMINAR SCHEDULE

**For more detailed Seminar Agenda Information, see our website.**

PRACTICAL FIELD BALANCING

A HANDS-ON APPROACH (Tuesday - Thursday; $1195, Opt. Test $225)

March 13-15 – Dallas, TX
May 8-10 – Charlotte, NC
July 24-26 – Myrtle Beach, SC
October 30 - Nov 1 – Charlotte, NC

TIME WAVEFORM ANALYSIS

(Tuesday — Thursday; $1545, No Testing)

May 15-17 – Charlotte, NC
October 9-11 – Charlotte, NC

ISO CAT I (ENTRY) — VIBRATION ANALYSIS

(Tuesday - Thursday, Class $1495; Opt. ½ Day Friday Testing $275)

January 23-25 – Charlotte, NC
February 6-9 – Orlando, FL
February 13-16 – Dallas, TX
February 20-23 – Charlotte, NC
April 3-6 – Seattle, WA
April 17-20 – New Orleans, LA
June 5-8 – Myrtle Beach, SC
June 12-15 – St. Louis, MO
July 17-20 – Denver, CO
July 31-Aug 3 – Myrtle Beach, SC
September 11-14 – Charlotte, NC
September 25-28 – Dallas, TX
October 9-12 – Philadelphia, PA
October 23-26 – San Diego, CA
November 27-30 – Houston, TX

ISO CAT II (ANALYSIS I)

(Tuesday - Thursday, Class $1695; Opt. ½ Day Friday Testing $300)

Jan 30 - Feb 2 – Charlotte, NC
February 13-16 – Orlando, FL
February 20-23 – Dallas, TX
March 6-9 – Charlotte, NC
April 10-13 – Seattle, WA
April 24-27 – New Orleans, LA
May 8-11 – San Antonio, TX
June 12-15 – Myrtle Beach, SC
June 19-22 – St. Louis, MO
July 24-27 – Denver, CO
August 7-10 – Myrtle Beach, SC
September 18-21 – Charlotte, NC
October 2-5 – Dallas, TX
October 16-19 – Philadelphia, PA
October 30 - Nov 2 – San Diego, CA
November 6-9 – Charlotte, NC
December 4-7 – Houston, TX

ISO CAT III (ANALYSIS II)

(Tuesday - Thursday, Class $1895; Opt. ½ Day Friday Testing $325)

Feb 27 - Mar 2 – Dallas, TX
March 6-9 – Charlotte, NC
March 20-23 – Dallas, TX
April 3-6 – Charlotte, NC
June 5-8 – Myrtle Beach, SC
June 12-15 – St. Louis, MO
August 14-17 – Myrtle Beach, SC
September 25-28 – Charlotte, NC
November 6-9 – San Diego, CA
November 13-16 – Charlotte, NC
December 11-14 – Houston, TX

ISO CAT IV, PART 1 (ANALYSIS III)

(Tuesday - Thursday, Class $1995; Opt. ½ Day Friday Testing $350)

March 6-9 – Dallas, TX
March 20-23 – Charlotte, NC
April 3-6 – Charlotte, NC
June 26-29 – Myrtle Beach, SC
October 2-5 – Charlotte, NC

ISO CAT IV, PART 2 (ADVANCED)

(Monday - Thursday, Class $2095; Opt. 8am - 1pm Friday Testing $400)

April 9-13 – Charlotte, NC

APPLIED MODAL & ODS ANALYSIS

(Monday 8am - Friday noon/$2145, No Testing)

August 20-24 – Charlotte, NC

SEMINAR FEES

Discounts: A $100 discount will be given on the seminar fees for early payments or written purchase orders received at least 60 days prior to the seminar beginning date.

Cancellation Policy/Change of Seminar Site: No fee will be charged for any cancellations made two weeks prior to Seminar beginning date. Cancellations/Change of Seminar Site after this date, but before the Seminar begins will be charged a $250 cancellation fee. No refund is available after the seminar begins.

To register for a Seminar, visit our website or contact Cheryle Benton at cbenton@technicalassociates.net or 704-333-9011.
HAS YOUR CONTACT INFORMATION CHANGED?

If your contact information has changed, please notify us so that we can advise you when it is time to renew your ISO Compliant Certification and keep you up to date on our latest news. You may email thicks@technicalassociates.net or visit our website at www.technicalassociates.net and click on the “Update Your Contact Info” link.

CERTIFIED INSTRUCTORS

HANDS-ON LEARNING

PREDICTIVE MAINTENANCE

DELIVERING RESULTS, RELIABILITY, & QUALITY ISO CERTIFICATION.

2018 SEMINAR LOCATIONS

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ADDITIONAL VIBRATION SERVICES AVAILABLE

- Vibration Acceptance Testing on New or Overhauled Machinery
- Vibration Diagnostic Investigations to Evaluate Machines with High Vibration and/or Quality Problems
- Modal Analysis of Machines or Structures Subjected to Resonance
- Operating Deflection Shape (ODS) Analysis of Machines or Structures
- Condition Monitoring Program Setup and Implementation
  - PdM Database Creation and Refinement
  - PdM Program Mentoring
  - PdM Program Audits
- Field Balancing of Rotating Machinery
- On-Line Diagnostics and Problem Solving
- To arrange for a quotation on a private on-site seminar, you may visit our website or email David Berry at dberry@technicalassociates.net.

ADDITIONAL PRODUCTS

Please visit our website at www.technicalassociates.net for additional products and services provided by Technical Associates of Charlotte. We have many Technical Papers and Illustrated Diagnostic Wall Chart Products available for purchase from our website or by calling us at 704-333-9011.

TECHNICAL ASSOCIATES BOARD OF CERTIFICATION (TABoC)

Training is partial preparation for the certification examination. Certification exam is “OPTIONAL” and will be offered on Friday morning. Candidates will need to complete an application and be approved.

CERTIFICATION RENEWAL

ISO compliant certifications are valid for 5 years and the expiration date is indicated on your certificate. You may apply for renewal of your certification during the 6-month period prior to that date. The Application for Renewal of ISO Compliant Certification form is available on the website at www.technicalassociates.net.

ADVANTAGES OF ON-SITE SEMINARS

- COST-EFFECTIVE: Private seminars for at least 5-6 people are typically cost-effective and less expensive than sending multiple people to a public seminar.
- MINIMIZE EMPLOYEE TRAVEL: By hosting a seminar at your plant you eliminate employee travel expenses.
- FLEXIBLE SCHEDULING: Our instructor can work around the particular scheduling demands of your plant.
- INCREASED EXPOSURE: When having a seminar on-site, peripheral personnel who otherwise would not attend can be introduced to this technology.
- CUSTOMIZED AGENDA: The sessions can be tailored to meet the unique needs and instrumentation or software of your facility.
- CONFIDENTIALITY: On-site seminars with only your employees ensures all discussions are confidential.
- OPTIONAL EXTRA DAY: An optional extra day of training is available for hands-on data collection and analysis of actual on-site machinery.
- FREE WALL CHART: The world-renowned Technical Associates’ Illustrated Vibration Diagnostic Chart will remain at your facility as a reference for your employees.

A NOTE FROM THE PRESIDENT

I would like to personally invite you to explore the numerous vibration services, seminars and products that we have developed over the past 30+ years. This fascinating vibration technology is my continuing passion that I love to share with others! Join us in this captivating journey!

JAMES E. BERRY, P.E.

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**DEFINITION OF UNBALANCE**

- Static Unbalance
- Couple Unbalance
- Quasi-Static Unbalance
- Dynamic Unbalance

**TYPES OF UNBALANCE**

- Assembly Errors
- Casting Blow Holes
- Fabrication Tolerance Problems
- Key Length Problems
- Rotational Distortion
- Deposit Buildup or Erosion
- Unsymmetrical Design

**PRACTICAL FIELD BALANCING TECHNIQUES**

Numerous Hands-on Exercises:
- Recommended Trial Weight Size
- How the Phase Mark on a Rotor Moves When a Trial Weight is Moved
- Single Plane Balancing Using Vector Diagrams and Portable Data Collectors
- Two Plane Balancing Using Portable Data Collector
- Overhung Rotor Balancing
- Multi-Plane Balancing
- Splitting of Balance Correction Weights
- Combination of Balance Correction Weights
- Effect of Angular Measurement Errors on Potential Unbalance Reduction

**RIGID VERSUS FLEXIBLE ROTORS**

Recommended Balancing Speed and Number of Planes

**BALANCING MACHINES - SOFT VERSUS HARD BEARING TYPES**

Recommended Vibration and Balance Tolerances

- Vibration Tolerance Tables
- Balance Tolerances (ISO, API & MIL Standards) on Allowable Residual Unbalance

**OPTIONAL BALANCING CERTIFICATION TEST IS OFFERED ON THURSDAY AFTERNOON**

**INTRODUCTORY TIME WAVEFORM CONCEPTS**

- Place of Time Waveforms in Vibration Analysis
- Importance of the FFT (Fast Fourier Transform)

**RECOMMENDED MEASUREMENT SETUPS FOR TIME WAVEFORM ANALYSIS**

- Velocity (Displacement)
- Acceleration
- Force

**DISPLACEMENT VS. VELOCITY VS. ACCELERATION WAVEFORMS**

- Damping Effects
- Signal to Noise Ratio (SNR)

**PROBLEM DETECTABLE ONLY BY TIME WAVEFORM ANALYSIS**

- Cracked or Broken Gear Teeth
- Rolling Element Bearing Turning on a Shaft
- Eccentricity
- Misalignment vs. Mechanical Looseness
- Worn Gear Teeth
- Fluid Film Bearing Wear
- Rolling Element Bearing Faults
- Rotor Rub

**PERIODIC VS. NONPERIODIC TIME WAVEFORMS - WHY IS THIS IMPORTANT?**

Effect of Impact on Time Waveforms and Spectra

**CREST FACTOR USED TO DETERMINE THE AMOUNT OF IMPACT PRESENT IN A WAVEFORM**

- Autocorrelation & Circular Time Waveform Diagnostics

**HOW TO DETECT INADEQUATE LUBRICATION USING TIME WAVEFORM ANALYSIS AND AUTOCORRELATION**

**HOW TO SPECIFY AND INTERPRET TIME WAVEFORMS FOR HIGH FREQUENCY ENVELOPE (HFE) MEASUREMENTS**

- Special Time Waveforms: When and How to Use a Special TWF for Both Normal Envelope Measurements

**SYNCHRONOUS TIME AVERAGING - WHAT IS IT AND WHEN SHOULD IT BE USED?**

**REAL-WORLD TIME WAVEFORM ANALYSIS CASE STUDIES**

**OPERATING DEFORMATION SHAPE ANALYSIS (ODS)**

- Definition of ODS Analysis and its Applications
- Required Number of Measurement Points & Directions
- Varying Speed and Load
- Checking for Reasonable Computer Animation Motion

**ODS CASE STUDIES (Real-World)**

- Structural Weakness & Flexure on a Paper Machine Support Frame
- ID Fan Frame & Bearing Pedestal Resonance
- Gearbox Housing Pedestal & Piping Flexure
- Vertical Pump Support Frame & Piping Resonance
- Soft Foot on a Belt Driven Fan

**EXPERIMENTAL MODAL ANALYSIS (EMA)**

- Definition of Modal Analysis & its Applications
- Mode Shape Type – Rigid Body, Bending, Twisting, Circular and Diametrical Mode Shapes
- Required Number of Measurement Points and Spectra
- Confirming not only that Resonance Exists, but also What Component is Resonant

**FREQUENCY RESPONSE FUNCTIONS (FRF’S)**

- Types of FRF’s (Dynamic Compliance, Dynamic Stiffness, Mobility, Impedance, Accelerance & Effective Mass)
- Coherence Function - Importance in Ensuring Reliable and Quality Modal Results
- Use of Real or Imaginary Component for Plotting Mode Shapes of Various Natural Frequencies
- Filtering Methods
- How to Properly Interpret Modal Computer Animations

**MODAL ANALYSIS CASE STUDIES (Real-World)**

- Boiler Feedwater Pump Bearing Housing Resonance
- Foundation & Bearing Pedestal Resonances
- Detection of Cracks on a Large Gearbox Due to Gearbox Housing Resonance
- Paper Machine Support Frame Resonance at Higher Operating Speeds
- Vertical Pump Main Support Plate Resonance

**HANDBOOK ON ME’scopeVES SOFTWARE TRAINING USING TECHNICAL ASSOCIATES “ME’scopeVES HANDBOOK”**

In-depth Instruction on Vibrant Technology’s ME’scopeVES Software including:
- Creating a Structural or Machine Computer Model
- Work with Real-World Modal/ODS Data
- Importing Data from Various Instruments
- Modal Analysis Curve Fitting
- Animating & Accurately Interpreting Modal & ODS Computer Animations
- Structural Dynamics Modification Capability (SDM)
- How to Develop Optimum Corrective Actions

**APPLIED MODAL & ODS ANALYSIS**

**OPERATING DEFLECTION SHAPE ANALYSIS (ODS)**

- Definition of ODS Analysis and Its Applications
- Required Number of Measurement Points & Directions
- Varying Speed and Load
- Checking for Reasonable Computer Animation Motion

**ODS CASE STUDIES (Real-World)**

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- How to Develop Optimum Corrective Actions

**INTRODUCTION TO PREDICTIVE MAINTENANCE (PdM) AND MACHINE VIBRATION ANALYSIS**

- Critical Role of Vibration Analysis in PdM

**MACHINE VIBRATION - BASIC THEORY & ANALYSIS**

- Characteristics of Vibration (Frequency & Period)
- Amplitude - Magnitude of Vibratory Motion
- RMS, Peak, & Peak-to-Peak Conversions
- Frequency - How Often the Vibration Occurs
- Phase - How one Machine Component or Support Frame Vibration Relates to Another

**PREPARATION FOR DATA COLLECTION**

- Types of Vibration Transducers
- Effect of Transducer Mounting on its Performance, Accuracy & Repeatability
- Choosing the Optimum Transducer Location
- Choosing an Optimum PdM Data Collector

**INTRODUCTION TO DATA COLLECTION SYSTEMS**

- Setting Up a PdM Database (Plants, Trains, Machines, etc.)
- Choosing the Proper Parameter (Vibration Acceleration, Velocity and/or Displacement)
- Understanding Setup Parameters (#Lines, Averages, Freq. Range, Window, %Overlap, etc.)
- Setting Up the Optimum PdM Routes & Intervals
- Checking Out the Proper Reports after Uploading

**INTRODUCTION TO PROBLEM RECOGNITION**

- How Common Machine Faults Appear in a Vibration Spectrum
- Basics of Reading a Spectrum (Identifies Peaks)
- Associating Spectral Patterns with Machine Condition
- Recognizing Fault Frequencies, Feats of Merit
- Identifying Frequencies Inherent with Specific Machine Types

**GENERAL MACHINE KNOWLEDGE**

- Common Industrial Machinery (Motors, Pumps, Fans, Compressors, etc.)
- Optimum Measurement Locations

**HANDS-ON DEMONSTRATIONS AND IN-CLASS EXERCISES WILL BE PROVIDED FOR STUDENTS TO ENHANCE THEIR UNDERSTANDING OF SEMINAR TOPICS. STUDENTS ARE ENCOURAGED TO BRING THEIR OWN ANALYZERS TO USE IN THESE DEMOS AND “BUTTON PushING” EXERCISES (IF THIS IS POSSIBLE).**

**OPTIONAL ISO CATEGORY I CERTIFICATION EXAM IS OFFERED FRIDAY MORNING BY TABofC**
ISO CATEGORY II
ANALYSIS I

REVIEW OF THE BASICS OF VIBRATION
• Comparison Between Frequency & Period
• What is Displacement, Velocity & Acceleration, and When & Why Should They Be Used?
• Relationship to Machinery Condition?
• How Phase Should Be Measured and its Results Evaluated to Detect Misalignment Versus Unbalance, Bent Shaft, Looseness, etc.
• How Much is Too Much Vibration?

OVERVIEW OF VIBRATION INSTRUMENTATION
ROLE OF HIGH FREQUENCY ENVELOPING (HFE) & HFD AND HOW THEY SHOULD BE USED
VIBRATION SIGNATURE ANALYSIS TO DIAGNOSE:
• Mass Unbalance
• Eccentric Rotors
• Bent Shaft
• Misalignment
• Mechanical Looseness (3 Types)
• Belt Drive Problems
• Introduction to Rolling Element Bearing Problems
• Introduction to Resonance Problem Detection
• Introduction to Electrical Problem Detection
• Introduction to Gear Problem Detection

PROPER SETUP OF PdM COMPUTER DATABASES:
• HOW TO SPECIFY THE PROPER VIBRATION PARAMETER, RANGE, FFT LINES, #AVERAGES, %OVERLAP, TRANSUDER, TRANSUDER MOUNTING, ETC.
• HOW TO SPECIFY SPECTRAL BAND ALARMS & FREQUENCY RANGES FOR VARIOUS MACHINE TYPES AND OPERATING SPEEDS

GENERAL MACHINE KNOWLEDGE
• Common Industrial Machinery (Motors, Pumps, Fans, Compressors, etc.)
• How these Machines Work

ACCEPTANCE TESTING
• Procedures and Standards

HOW TO IMPLEMENT AN EFFECTIVE PREDICTIVE MAINTENANCE PROGRAM (PdM)

REAL-WORLD CASE HISTORIES:
• Provided to clearly illustrate the diagnostic methods taught in the seminar, using real-world machines that have been evaluated by Technical Associates.

OPTIONAL ISO CATEGORY II CERTIFICATION EXAM IS OFFERED FRIDAY MORNING BY TABofC

ISO CATEGORY III
ANALYSIS II

INTRODUCTION TO NATURAL FREQUENCY TEST METHODS AND REQUIRED INSTRUMENTATION
(What is Displacement, Coastrand, Bode’ & Polar Plot Generation, & Dynamic Vibration Absorber Design)

ENHANCED VIBRATION DIAGNOSTICS USING CASCADE AND WATERFALL PLOTS
PRESENTATION OF A 210 PAGE PAPER

COVERING TECHNICAL ASSOCIATES’ WORLD RENOWN “Illustrated Vibration Diagnostics Wall Chart”:

IN-DEPTH COVERAGE ON HOW TO DETECT THE FOLLOWING PROBLEMS:
• Resonance Problems
• Tracking of Rolling Element Bearing Condition
• Plain Bearing Problems
• Rotor Rub
• Flow-Induced Vibration Problems
• Gear Problems
• Election of Problems With AC Induction Motors
• Introduction to DC Motor Vibration Analysis
• Beat Vibration Problems
• Soft Foot/Distorted Frame Problems

HOW TO REFINE BOTH OVERALL AND SPECTRAL BAND ALARMS USING STATISTICAL TECHNIQUES

INTRODUCTION TO NARROWBAND ENVELOPE ALARMS FOR VARIOUS MACHINE TYPES AND OPERATING SPEEDS

INTRODUCTION TO TIME WAVEFORM ANALYSIS TO DETECT A VARIETY OF MACHINE PROBLEMS

PRINCIPLES OF SIGNAL PROCESSING FOR RELIABLE SPECTRAL AND TIME WAVEFORM ANALYSIS AND MEASUREMENT SETUPS

INTRODUCTION TO HIGH FREQUENCY ENVELOPING (HFE) ANALYSIS

INTRODUCTION TO VIBRATION ISOLATION

INTRODUCTION TO VIBRATION DAMPING

GENERAL MACHINE KNOWLEDGE
• Process Machines and Other Equipment (Steam Turbines, Paper Machines, Rolling Mills, Pipings & Structures, etc.)
• How these Machines Work

REAL-WORLD CASE HISTORIES
• Provided to clearly illustrate the diagnostic methods taught in the seminar, using real-world machines that have been evaluated by Technical Associates.

OPTIONAL ISO CATEGORY III CERTIFICATION EXAM IS OFFERED FRIDAY MORNING BY TABofC

ISO CATEGORY IV, PART 1
ANALYSIS III

TIME WAVEFORM DIAGNOSTIC ANALYSIS
• Use of Waveforms to Detect Cracked or Broken Gear Teeth, Excessive Gear Wear, Rolling Element Bearing Failures, Motor Electrical Problems, Machine Tool Chatter, Misalignment, Unbalance, Looseness, Rotor Rubs, etc.

• Proper Setup of Time Waveforms for Fault Detection (#Samples, Sampling Time or IMAX, Rotor Frequency Range, etc.)

HOW TO ANALYZE LOW-SPEED MACHINES
(PARTICULARLY 6 TO 120 RPM MACHINES)

HOW TO ANALYZE VARIABLE-SPEED MACHINES

HOW TO AND HOW NOT TO CREATE MEANINGFUL NARROWBAND SPECTRAL ENVELOPE ALARMS
• Definition of Narrowband Envelope Alarms
• Influence of Statistical Analysis

• Demonstration on How to & How Not to Create Meaningful Narrowband Alarms

INTRODUCTION TO MOTOR CURRENT SPECTRAL ANALYSIS TECHNIQUES & INSTRUMENTATION:
• Instruments & Transducers Required
• Comparison of Motor Current With Vibration Spectral Analysis

• Presentation of TA’s “Motor Current Severity & Recommended Corrective Actions Chart”

HOW TO DETECT PROBLEMS WITH DC MOTORS AND THEIR ELECTRONIC CONTROLS

DETECTION OF ELECTRICAL CONTROL PROBLEMS IN AC AND DC MOTORS (SCR’S, FIRING CARDS, COMPARITOR CARDS, ETC.)

DETECTION AND PREVENTION OF ELECTRICAL FLUTING IN AC AND DC MOTORS

OPERATING DEFLECTION SHAPE ANALYSIS USING COMPUTER ANIMATED SOFTWARE

IN-DEPTH HIGH FREQUENCY ENVELOPE (HFE) SPECTRAL & TIME WAVEFORM ANALYSIS USING A VARIETY OF TOOLS ANALYZERS

REAL-WORLD CASE HISTORIES
• Provided to clearly illustrate the diagnostic methods taught in the seminar, using real-world machines that have been evaluated by Technical Associates.

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ISO CATEGORY IV, PART 2
ADVANCED

IN-DEPTH TIME WAVEFORM ANALYSIS
• Synchronous, Nonsynchronous & Circular Time Waveform Diagnostics
• Autocorrelation Techniques

MULTI-CHANNEL DIAGNOSTIC TECHNIQUES
ORDER TRACKING TECHNIQUES REQUIRED ON VARIABLE SPEED MACHINES

HOW TO IDENTIFY RESONANCE
• Impact Natural Frequency Test Methods
• Transient Analysis (Start-up, Coastdown, Bode’ and Nyquist Plotting)
• Cross Channel Phase, Coherence & Torsional Vibration Analysis

INTRODUCTION TO ODS ANALYSIS
• Definition of Operating Deflection Shape Analysis
• What Operating Deflection Problems ODS can Detect

• How to Properly Perform ODS Analysis using a Number of Today’s Data Collectors & Spectrum Analyzers

• How to Generate and Accurately Interpret ODS Computer Animations

• Real-World ODS Analysis Case Studies

INTRODUCTION TO MODAL ANALYSIS
• Tips on Computer Model Development of Machinery and Structures
• Required Numbers of Points and Directions
• Definition of Frequency Response Functions (FRF’s) and their Significance

• How to Accurately Interpret Computer Model Animations and Detect the Problems they Reveal

• Best Practices Needed to Resolve Resonance Problems

• Real-World Modal Analysis Case Histories

COMPARISON OF ODS ANALYSIS WITH MODAL ANALYSIS USING REAL-WORLD CASE HISTORIES

IN-DEPTH VIBRATION ISOLATION MECHANISMS

IN-DEPTH VIBRATION DAMPING TREATMENTS

INTRODUCTION TO ROTOR DYNAMICS
• Plain Bearing Types and Applications
• Plain Bearing Failure Analysis Techniques

• Rotor Characteristics and Rotor Balancing
• Orbit and Shaft Centerline Analysis

• Flexible Rotor Balancing

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OBJECTIVE

Build upon Analysis I topics while providing a solid foundation for PdM Program Setup on Common Rotating Machinery by:
(1) Intensive Vibration Signature Analysis via Coverage of all FFT Lines for “Illustrated Vibration Diagnostics Wall Chart”
(2) Introduction to Time Waveform Diagnostic Analysis
(3) Refinement of Overall & Spectral Band Alarms
(4) Introduction to Natural Frequency Test Methods & Instruments
(5) Introduction to High Frequency Enveloping (HFE) Spectral & Time Waveform Analysis

This Newly Updated Seminar Completes Coverage of all Training Requirements for ISO Category IV Certification as per the ISO 18436-2 Document. It provides a comprehensive overview of all Vibration Diagnostic Techniques required to identify and resolve all vibration-related issues, including but not limited to, detection of faults in machinery and structures, and the necessary steps to diagnose and resolve these issues.

This seminar focuses on providing an in-depth understanding of vibration analysis techniques and their applications in real-world scenarios. It covers the entire vibration diagnostics process, from data collection to analysis and interpretation, equipping participants with the knowledge and skills necessary to effectively identify and resolve vibration-related problems in various machinery and structures.