EMERSON ™
Process Management

Machinery Health™ Management

Training & Certification Course Catalogue
Middle East & Africa

Providing the training you need,
when and where you need it.

EMERSON™
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Educational services receives authorized provider status for awarding continuing education units from the International Association for Continuing Education and Training (IACET)

Emerson Process Management Educational Services is pleased to become a recognized member of the IACET group of trainers and educators. Our instructors, materials and programs we utilize to teach our students *what they need to know* about the products they use are considered by many, the best in the industry. Acceptance into the IACET Authorized Provider membership is a testament to the program.

Over 50 Training Centers in 35 Countries around the world

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MACHINERY HEALTH™ MANAGEMENT

Companies today rely on fewer people to do more work. That's why the need for training is more critical than ever to achieve and maintain cost-effective maintenance programs.

Emerson helps maximize the return on your investment in technology and people.

Our instructors share their own real-world experiences and guide classes through hands-on exercises that reinforce the lesson.

Emerson's Machinery Health Management strategy includes training courses designed to help you start-up and maintain your mechanical equipment. Our goal is to provide you with the knowledge to keep your plant running smoothly.

Paths to Success

Emerson Training is a proven means for acquiring confidence and experience in the technologies associated with industrial maintenance. Our alumni are considered valuable assets to their organizations, and can tell of the recognition and job promotions they've received from plant management. Attending Emerson Training is an investment in your career and the efficient and competitive operation of your facility. More than simply a catalog of courses, Emerson Training is an educational path that leads to full mastery of the knowledge and skills necessary in a Machinery Health program. These "Paths to Success" are outlined for you here. They include both theory and application classes that are required for certification as well as product-specific classes for getting the most out of your existing hardware/software tools. These same hands-on, application-intensive courses offered in our own classroom environment can also be taught in your facility.

Category I Vibration Analyst Path to Success

- Fundamentals of Vibration Analysis – can be taken with the Fundamentals of CSI 2130 Machinery Health Analyzer in the same week.
- Fundamentals of CSI 2130 Machinery Health Analyzer – can be taken with the Fundamentals of Vibration Analysis course in the same week
- Introduction to AMS Machinery Manager
- Basic Vibration Analysis/ISO Category I Compliant
- Category I Vibration Analyst Certification exam

Category II Vibration Analyst Path to Success

- Intermediate AMS Machinery Manager
- Intermediate Vibration Analysis/ISO Category II Compliant
- Category II Vibration Analyst Certification exam
- Optional course highly recommended: CSI 2130 Advanced Function with PeakVue®

Category III Vibration Analyst Path to Success

- Advanced AMS Machinery Manager
- Advanced Vibration Analysis/ISO Category III Compliant
- Category III Vibration Analyst Certification exam
- Optional course highly recommended: PeakVue® Mystery and Autocorrelation

Online Monitoring Path to Success

- Online Prediction (CSI 4500/6500/XP32) Operation and Maintenance
- Online Protection (CSI 6000/6500) Operation and Maintenance
- Turbo Machinery Diagnostic

Lubrication Analyst Path to Success

- Lubrication Level 1 & 2 with Certification exam
- Wear Debris Analysis Workshop
- OilView® for AMS Machinery Manager

Reliability Management Path to Success

- Maintenance Best Practice
- Root Cause Failure Analysis

Adding other Technologies to your Credentials

- Laser Alignment
- Balancing Theory & Application
- Basic Ultrasonic Theory & Technology & Level 1 Certification Exam
- Electric Motor Diagnostics & Basic MotorView
- IR Thermography & Level 1 Certification Exam

Basic Vibration Analysis/ISO Category I Compliant (Course# 2031)

This 4 day course complies with **Category I Vibration Analyst per ISO standard 18436-2:** Vibration condition monitoring and diagnostics.

This course is intended to enable students to recognize the difference between good and bad data, and compare vibration measurements against pre-established alert settings.

Prerequisites:

Fundamentals of vibration analysis course or a cumulative six months of field experience is recommended.

Topics to be covered:

- Principles of Vibration
- Data acquisition & Signal processing
- Condition monitoring & Corrective action
- Acceptance testing
- Basic analyzer functions
- The class shows students how to recognize machine defects such as:

- Unbalance
- Shaft misalignment
- Looseness
- Rolling element bearing defects
- Gear problems
- Resonance
- Introduction to electrical defects.

ISO Compliant Vibration Certification Exam

Course# 2021EX: Category I exam, available at the end of course# 2031
Test Format: Written exam, Duration: 2 hours, Passing Grade: 75%

Intermediate Vibration Analysis/ISO Category II Compliant (Course# 2032)

This 4-day course complies with **Category II Vibration Analyst per ISO standard 18436-2:** Vibration condition monitoring and diagnostics.

Category II vibration analysts are expected to be able to select appropriate vibration measurement techniques, set up instruments for basic resolution of amplitude, frequency, and time, perform basic spectrum analysis, maintain a database of results and trends, perform single-channel impact tests, classify, interpret, and recommend minor corrective actions.

Prerequisites:

Basic Vibration Analysis course and a cumulative 18 months of field experience are recommended.

Topics to be covered:

- Equipment testing and diagnostics
- Reporting and documentation
- Fault severity determination
- Analyzer averaging techniques
- Slow Speed Technology (SST®)
- Sensor selection guidelines

- Introduction to demodulation and PeakVue®
- Advanced waveform analysis
- Sideband analysis
- Rolling element bearing failure modes
- Phase analysis using single and dual channel
- Perform basic single-plane field balancing

ISO Compliant Vibration Certification Exam

Course# 2022EX: Category II exam, available at the end of course# 2032
Test Format: Written exam, Duration: 3 hours, Passing Grade: 75%

Advanced Vibration Analysis/ISO Category III Compliant (Course# 2033)

This 4-day course complies with **Category III Vibration Analyst per ISO standard 18436-2:** Vibration condition monitoring and diagnostics.

The class details advanced analysis techniques. The dual channel machinery health analyzer features are introduced including the use of AMS Machinery Manager Software to set up the advanced analyzer features and the powerful downloadable programs for data collection. The transient machinery health analyzer capabilities are covered such as long-term time waveform. The class covers advanced resonance detection using a variety of testing methods, including triggered data collection.

Prerequisites:

Intermediate Vibration Analysis course and a cumulative three years of field experience are recommended.

Topics to be covered:

- Specify appropriate vibration instrumentation hardware and software for both portable and permanently installed systems
- Perform spectrum and time waveform analysis under both steady-state and unsteady operating conditions
- Establish vibration monitoring programs
- Establish specifications for vibration levels and acceptance criteria for new machinery
- Measure and analyze basic operational deflection shapes (ODS)

- Measure and analyze PeakVue® measurements
- Prepare and submit machinery condition reports
- Provide instruction and technical direction to vibration trainees
- Slow Speed Technology (SST®)
- Zoom Analysis
- Transient Techniques
- Dual Channel Machinery Analyzer Features
- Triggered Data Capture
- Resonance Detection

ISO Compliant Vibration Certification Exam

Course# 2023EX: Category III exam, available at the end of course# 2033
Test Format: Written exam, Duration: 4 hours, Passing Grade: 75%

Introduction to AMS Machinery Manager & Fundamentals of CSI 2130 (Course 2068 & 2072)

This 4-day course is designed for the new users of AMS Machinery Manager. Students learn methods of database creation and vital features of route creation such as collecting reference data, analyzer/computer communication, and the basic concepts of Analysis Parameter Sets, Alarm Limit Sets, and Fault Frequency Sets. This hands on course focuses on the basic operation of the CSI 2130 Machinery Health Analyzer to load routes and collect data on lab machinery for some basic vibration analysis using Vibration Analysis module.

Prerequisites:

Computer experience with the Windows operating system and some vibration analysis experience are recommended.

Topics to be covered:

- Navigation
- Database creation
- Data collection
- Analyzer/computer communication
- Predefined route data collection
- Off-route data collection and setup
- Monitor mode measurements
- Basic analysis and reporting
- Link to RBMview

Intermediate AMS Machinery Manager (Course# 2074)

This 4-day course teaches some of the more advanced machinery analysis techniques available in AMS Machinery Manager Software. This course focuses more on analysis and reporting with the use of PlotData, Vibration Analysis module, PeakVue® and full version of RBMview.

This course is based on the current mass release of the AMS Machinery Manager software.

Prerequisites:

Intro to AMS Machinery Manager (course # 2068), Basic Vibration Analysis course or 6 months vibration analysis experience are recommended.

Topics to be covered:

▸ Diagnostic Plotting
▸ Vibration Analysis module
▸ PeakVue®
▸ Exception reporting
▸ RBMview
▸ Nspectr® Basics
▸ Data Transfer

Advanced AMS Machinery Manager (Course# 2070)

This 4-day course is the third in our series of AMS Machinery Manager courses. Hands-on practice includes the creation of a class database with example machines and collection of vibration data used for problem analysis and reporting. Participants learn to use the advanced analysis and reporting functions of AMS Machinery Manager.

Prerequisites:

Intermediate AMS Machinery Manager (course # 2074). Intermediate Vibration (course #2032) or one year vibration analysis experience are recommended.

Topics to be covered:

▸ Advanced analysis features in Diagnostic Plots
▸ Problem reporting
▸ Status-at-a-Glance operation and reporting
▸ Nspectr®
▸ Wizard - reporting techniques and modification/ addition of setup information
▸ Austostat
▸ DButly
▸ DBZip
▸ NetAdmin
▸ Data Locker Management

Taking the Mystery out of PeakVue® Technology (Course# 2035)

This 2-day course provides insight into advanced functionality of Emerson's patented PeakVue® technology and Autocorrelation. Machine vibrations generate both macro and microscopic vibrations, and microscopic vibrations generate stress waves that have frequency ranges determined by the mass of the impacting object. The properties of these stress waves will be explained.

This course makes use of both case studies from real-life examples of common faults and live demonstrations illustrating specific mounting procedures to reliably detect certain faults. The difference between PeakVue® techniques and demodulation will also be demonstrated.

Prerequisites:

Students should be familiar with vibration data collection and analysis techniques and the use of AMS Machinery Manager Software.

Topics to be covered:

▸ Proper PeakVue® set-ups for all speeds (as low as 1 rpm)
▸ Sensor selection and sensor mounting
▸ Setting alarm levels
▸ Choosing trend parameters
▸ Analyzing PeakVue® spectra and waveforms
▸ Uses of the circular waveform plot
▸ Introduce the autocorrelation coefficient
▸ Highlight the strengths of the autocorrelation coefficient function data relative to spectra data

Lubrication Level I (Course# 2082A)

This 2-day course is designed for individuals who have limited or no oil analysis experience. Guidelines and instruction for starting an oil analysis program will be provided. The course focuses on the basic properties of lubricants and lubricant specifications including additive packages. An overview of laboratory testing methods and interpretation of test data is taught. In addition, instruction is provided on proper storage and handling of new, unused lubricants, as well as sample point identification and best practices for collecting samples from machinery. Basic contamination control and wear debris analysis and identification is covered.

Prerequisites:

None.

Topics to be covered:

▸ The productive lubricant analysis program
▸ Analyzing oil data
▸ Identifying common types of wear debris, their origins, and corrective actions
▸ The importance of contamination control
▸ Designing sampling, storage and handling procedures

*Optional Level I Lubrication Certification
- no charge*

Balancing Application with CSI 2130
(Course# 2015)

This 2-day class on Balancing Applications with CSI 2130 teaches how to perform single- and dual-plane balancing using both graphical and analyzer-based balancing methods. The class uses the CSI 2130 Machinery Health Analyzer on lab machinery.

Prerequisites:

Understanding of vibration analysis is recommended

Topics to be covered:

▸ Imbalance identification
▸ Use of vectors
▸ Calculating influence coefficients
▸ Use of the auxiliary analyzer balance functions
▸ Use of UltraMgr module
▸ Estimate trial weights
▸ Applying balancing techniques in an industrial setting
▸ Balancing overhung rotors

Maintenance Best Practices (Course# 2093)

In today's maintenance programs proper installation and maintenance are essential. This 2-day Maintenance Best Practices course will give the maintenance technician the knowledge to correctly identify various types of components, proper installation and their location on various machines. The course will also discuss safe work practices and safe lock out and tag out.

Prerequisites:

None.

Topics to be covered:

▸ Bearing identification and installation
▸ Component lubrication
▸ Mechanical Seal identification and installation
▸ Couplings
▸ Thread pitch
▸ Pumps (Centrifugal, Positive Displacement.)
▸ Compressors
▸ Turbines
▸ Gear Boxes
▸ Belt and Chain Drives (sprockets, sheaves)
▸ Conveyors
▸ Lubrication

Online Prediction (CSI 4500/6500/XP32) Operation and Maintenance (Course# 2088)

This 4-day course best suits those who have a CSI 4500, CSI 6500 or XP32 system installed and operational prior to attending the course.

The course is designed for:

▸ System users or analysts
▸ Personnel using the CSI 4500, CSI 6500 or XP32 daily
▸ Those responsible for configuring databases and analyzing data

Prerequisites:

Knowledge of vibration and industrial machinery is helpful, but not necessary.

Topics to be covered:

▸ Vibration basics and terminology relating to the CSI 4500, CSI 6500 or XP32
▸ System overview: functionality and system components
▸ Online Watch - used to monitor the system daily
▸ Online Configuration - adding a new machine to an existing database

▸ Vibration Analysis Module - spectrums, waveforms and trend data
▸ PeakVue® Processing
▸ Transient setup and capture evaluation
▸ Review of customer databases

Online Protection (CSI 6000/6500) Operation and Maintenance (Course# 2080)

This 2-day course is a hands-on training for anyone involved with operating and maintaining a CSI 6000/6500 System. Workshops include practice with "live" monitors and racks.

Topics to be covered:

▸ Overview of hardware components
▸ Rack configuration
▸ Operator display software
▸ Data acquisition software
▸ Interface with the CSI Online prediction system
▸ System troubleshooting and maintenance.

Providing the training you need, when and where you need it.

Other Courses Available:

ATC - 2091 Advanced CSI2130 with PeakVue®

ATC - 2075 Autocorrelation as an Advanced Diagnostic Tool

ATC - 2092 Laser Alignment (for UltraSpec users only)

ATC - 2039 Introduction to Windows-based ODS/Modal

ATC - 2081 Electric Motor Diagnostics and MotorView

ATC - 2082B Level II Lubrication

ATC - 2083 OilView for AMS Machinery Manager

ATC - 2084 Wear Debris Analysis Workshop

ATC - 2053 Root Cause Failure Analysis

ATC - 2018 Infrared Analysis Software for AMS Machinery Manager

ATC - 2019 IR Thermography Level I with Certification

ATC - 2067 Basic Ultrasonic Theory and Techniques

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2010 MIDDLE EAST AND AFRICA MACHINERY HEALTH™ MANAGEMENT TRAINING CALENDAR

Optimize Your Most Important Asset - Your Staff

2010

Category columns (left to right): Online Machinery Monitoring · Performance Monitoring · Vibrating Analysis and Balancing · Alignment · Electric Motor Diagnostics · Lubrication Analysis · Infrared Thermography · Machinery Health Management · Wireless Machinery Health Transmitter · Machinery Health Transmitter · Ultrasonic Testing

Training events by month:

- **January:** Intro to AMS Machinery Manager & Fundamentals of CSI 2130 – Al-Khobar, Saudi Arabia (Jan 24–27)
- **February:** Basic Vibration Analysis / ISO Category I – Abu Dhabi, UAE (Feb 22–25)
- **March:** Intermediate AMS Machinery Manager – Cairo, Egypt; Lubrication Level-I – Cairo, Egypt (Mar 10–11); Basic Vibration Analysis / ISO Category I – Bahrain; Basic Vibration Analysis / ISO Category I – Dubai, UAE (Mar 22–25)
- **April:** Taking Mystery out of PeakVue® – Al-Khobar, Saudi Arabia (Apr 26–27)
- **May:** Basic Vibration Analysis / ISO Category I – Qatar; Intermediate AMS Machinery Manager – Al-Khobar, Saudi Arabia (May 16–19)
- **June:** Taking Mystery out of PeakVue® – Abu Dhabi, UAE (Jun 12–13); Basic Vibration Analysis / ISO Category I – Qatar (Jun 7–10); Intermediate AMS Machinery Manager – Abu Dhabi, UAE (Jun 27–30)
- **July:** Basic Vibration Analysis / ISO Category I – Abu Dhabi, UAE (Jul 19–22)
- **August:** Intermediate AMS Machinery Manager – Sohar, Oman (Aug 2–5)
- **September:** Lubrication Level-I – Al-Khobar, Saudi Arabia (Sep 28–30)
- **October:** Basic Vibration Analysis / ISO Category I – China (Oct 4–7); Intermediate Vibration Analysis / ISO Category II – Kuwait (Oct 18–21)
- **November:** Advanced AMS Machinery Manager – Al-Khobar, Saudi Arabia (Nov 7–11)
- **December:** Intermediate Vibration Analysis / ISO Category II – Al-Khobar, Saudi Arabia (Dec 12–15)

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