



Machinery Diagnostics Institute

MDI – Machinery Diagnostics Institute are worldwide professionals providing class room and virtual online interactive technical trainings, based in Queensland – Australia.

Teaching staff are real practitioners specialized in delivering knowledge of Machinery Diagnostics techniques from basic levels to the most advanced.

Helping technical teams to develop their knowledge, knowing how to best utilize the most advanced diagnostics techniques and improve site performance through delivering accredit trainings and guiding them to the best practices.



**Vibration
Analysis**



**Thermal
Imaging**



**Machinery
Lubrication**



**Ultrasound
Testing**



**Turbo-
Machinery
Analysis**



**Machinery
Balancing**



**Shaft
Alignment**



**Asset
Reliability**

OUR PARTNERS





Mobius Institute
Industry's Leading Vibration
Analysis Training & Certification
Providers

Vibration Analysis CAT I

ISO 18436 – VA CAT I

ISO Vibration Analysis CAT I is a Three-days course, the training is the ideal starting place for new vibration analysts, people collecting vibration data, and those who want a better understanding of vibration analysis and condition monitoring.

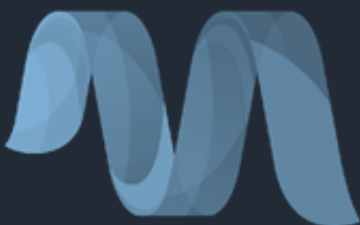
ISO Vibration Analysis – CAT I Training Main Topics:

- Maintenance practices & CM
- Principles of vibration
- Introduction to vibration measurement
- Introduction to the time waveform
- Introduction to the spectrum
- Introduction to forcing frequencies
- Explaining the vibration units
- A brief introduction to phase
- Data acquisition
- Sensors places on the machine
- Sensor mounting and surface preparation
- Signal processing
- A quick tour of your analyser
- Spectral averaging
- Vibration analysis
- The spectrum analysis process
- Diagnosing common fault conditions
- Setting alarm limits

- Vibration the **oldest** and most known tool for Machinery Conditioning Monitoring.
- The ISO 18436 and the very first parts of it is for the vibration analyst training.
- **MCS – Machinery Diagnostics Institute** has the ability to deliver **Mobius Institute's** courses anywhere worldwide without being committed to a specific territory.

MDI – Machinery Diagnostics Institute Provides this training,
Accredit certification of successful completion is issued from **Mobius Institute** after the training.

Accredit certification according to ISO 18436 is issued from **Mobius Institute** after passing the ISO examination.



MDI - Machinery Diagnostics Institute - Gracemere, Queensland – Australia
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Web: www.mdiagnostics.net



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Vibration Analysis CAT II

ISO 18436 – VA CAT II

ISO Vibration Analysis CAT II is a four-days course, the training 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 faults conditions, and understand balancing and alignment.

ISO Vibration Analysis – CAT II Training Main Topics:

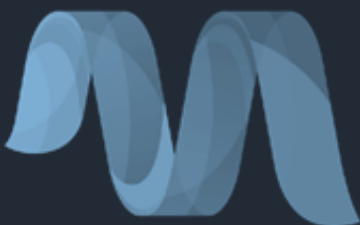
- Review of maintenance practice
- Review of condition monitoring tech
- Principles of vibration
- Complete review of basics
- Waveform, spectrum (FFT), phase & orbits
- Signals: modulation, beating.. Etc.
- Data acquisition
- Signal processing
- Vibration analysis
- Fault analysis
- Equipment testing and diagnostics
- Correction action
- Running a successful CM program
- Acceptance testing
- Review of ISO standards

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Vibration Analysis CAT III

ISO 18436 – VA CAT III

ISO Vibration Analysis CAT III is a five-days course, the training is intended for people who are confident with spectrum analysis but wish to push on and learn more about signal processing, time waveform and phase analysis, cross-channel testing, machine dynamics, and fault correction.

ISO Vibration Analysis – CAT III Training Main Topics:

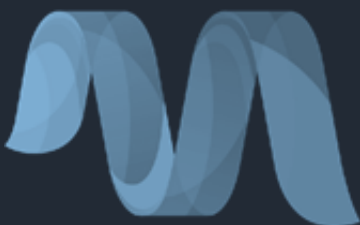
- Condition monitoring and ISO standards
- Signal processing and data acquisition
- Time waveform analysis
- Phase analysis
- Natural frequencies & resonance
- Operating Deflection Shape (ODS)
- Modal analysis and intro to FEA
- Correcting resonances
- Journal bearing fault detection
- Electric motor testing
- Rolling element bearing fault detection
- Pumps, fans and compressors
- Gearbox fault detection
- Corrective action / Acceptance testing
- Review of ISO standards

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Vibration Analysis CAT IV

ISO 18436 – VA CAT IV

The primary focus the course is the measurement, analysis, dynamics & balancing of turbomachinery.

Topics will include proximity probe and casing measurements, orbit and centerline plot analysis, rotor dynamics (natural frequencies, modeling), journal bearings (design, fluid film instabilities), and flexible rotor balancing, as it will also cover torsional vibration.

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Course Parts - Part 1:

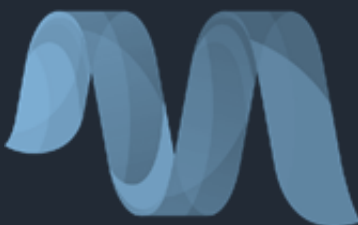
Focus must be given on advanced signal processing, structural dynamics, corrective action (isolation, resonance correction, etc.), ODS, and modal analysis.

Along with the topic review we will go through the worked examples and students will be given poll questions to test their knowledge.

Part 2:

Focus must be given on proximity probe measurements, conventions, orbits, center line plots, journal bearings, rotor dynamics, diagnosing common faults associated with journal bearings and turbo-machinery, and flexible rotor balancing.

Along with the topic review we will go through the worked Examples and students will be given poll questions to test their knowledge.



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Machinery Lubrication CAT I

ISO 18436 – MLA 1

Machinery Lubrication Level I is a Four-day course, You will learn proven industry methods for selecting, storing, filtering and testing lubricants to boost reliability and generate lasting results in machine efficiency/maintenance.

Machinery Lubrication Analysis – CAT I Training Main Topics:

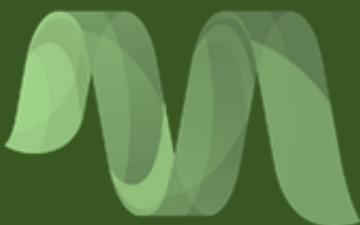
- Maintenance Strategies
- Tribology Fundamentals
- Lubrication Construction
- Lubrication Viscosity
- Lubrication Additives
- Greases Fundamentals
- Lubrication Failure & Monitoring
- Oil Analysis Best Practice
- Lubrication Contamination
- Lubrication Contamination Control
- Lubricating Machinery - Oil Application
- Lubricating Machinery - Grease Application
- Lubrication Selection
(Bearing, Gears, Electric Motors,
Automotive, Turbines, Compressors .. Etc.)
- Lubrication Storage & Handling
- Field Inspections & Tests

As well as gaining better understanding of oil analysis, so they can align their efforts with those of maintenance professionals or oil analysis experts.

MDI - Machinery Diagnostics Institute Provides this training,

Accredit certification of successful completion is issued from **MDI – Australia** after the training

Accredit certification according to ISO 18436-4 is issued from **ICML – International Council for Machinery Lubrication** after passing the ICML examination



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Machinery Lubrication CAT II

ISO 18436 – MLA 2

Machinery Lubrication Level II is a Four-day course, You will learn what to look for when sampling and performing your own on-site oil tests detecting harmful particle and thermal stressors that degrade lubricants before they do serious damage.

If you find yourself wanting to bring the valuable benefits of on-site fluid testing to your workplace, Oil Analysis II will equip you with everything you need.

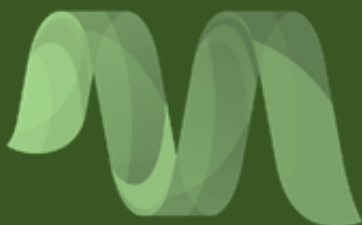
Machinery Lubrication Analysis – CAT II Training Main Topics:

- Maintenance Strategies, Oil Analysis & Reliability
- Tribology Fundamentals & Lubrication Theory
- Oil Analysis Program Best Practice
- OACAT I – Lubrication Failure & Health Monitoring
- OACAT II – Contamination Monitoring & Control
- OACAT III – Wear Particle Analysis
- Oil Analysis Report Interpretation.
- Oil Field Inspection & Tests

MDI - Machinery Diagnostics Institute Provides this training,

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Thermal Imaging CAT I

ISO 18436 – IRT 1

Level I Certified Infrared Thermographer® is a five-day course for the application of qualitative thermal imaging for P/PM, Condition Assessment, Condition Monitoring, Quality Assurance, Forensic Investigations, and Building Sciences.

Infrared Thermography – CAT I Training Main Topics:

☐ Introduction to Thermal Imaging

- Course Overview , Overview of IR Applications

☐ Introduction to Infrared Theory

- Basic Infrared Theory & Thermal Imaging Systems, Heat Transfer Concepts
- Emittance, Reflectance & Transmittance

☐ Thermal imaging camera (equipment) setup & operation

- Imager Operation & Selection
- Selecting and Purchasing a Thermal Imager – What You Need to Know

☐ Infrared Thermography Program

- Nine Steps to Setting up an Infrared Program, Program Economics & Benefits
- Recording Data & Images/ Generating a Qualitative Report
- Quick Start Procedure for Creating Reports in TI Reporter™

☐ Electrical Systems Inspection

- Infrared Inspection of Electrical Systems
- 7 Common Electrical Defects Detectable by Thermography

☐ Mechanical Systems Inspection

- Infrared Inspection of Mechanical Systems
- Steam and Fluid Systems

☐ Energy Loss

- Infrared Inspection for Energy Loss
- Energy Loss – Radiation, Convection, Conduction

☐ Insulated Roofs Systems Inspection

- Infrared Inspection of Insulated Roofs
- Standard for Infrared Inspection of Insulated Roofs



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Thermal Imaging CAT II

ISO 18436 – IRT 2

Level II Certified Infrared Thermographer® is a five-day course for the application of qualitative thermal imaging for P/PM, Condition Assessment, Condition Monitoring, Quality Assurance, Forensic Investigations, and Building Sciences.

Infrared Thermography – CAT II Training Main Topics:

1. Thermometry Fundamentals

- Temperature scales and conversions
- Absolute and relative temperatures
- Classes and benefits of contact thermometers
- Classes and benefits of non-contact thermometers
- Identifying and reducing errors

2. Advanced IR Theory

- Units for measuring radiant power
- Relationship between power and temperature
- Planck's blackbody curves

3. Temperature Measurement Error Sources and Corrections

- Calibration / Reflectance / Emittance / Transmittance / Target Width/Distance Ratios

4. Traceable Temp. Limits: How Hot is Too Hot

- Delta T classifications
 - NETA, Mil Spec, and other standards
- Absolute temperature classifications
 - ANSI, IEEE, NEMA standards for electrical systems
 - correction formula for load and ambient temperature
- Developing limits for your equipment

5. Preparing Quantitative Reports

- Data to gather
- Report procedures
- Image processing software capabilities
- Report generation software capabilities

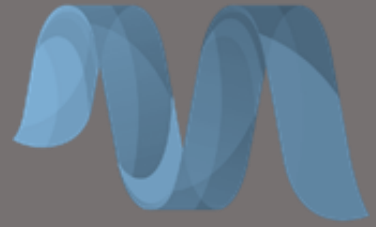


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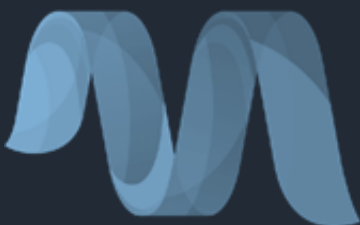
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The training provider for Advanced
Turbomachinery Analysis & Rotor
Balancing training course and
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Advanced Turbomachinery Analysis

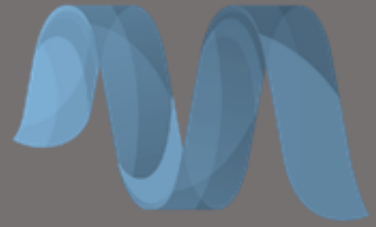
A Five-Days training course will provide all technical information of advanced levels with a very detailed and rich topics covering the most advanced turbo-machinery faults and its diagnostics techniques.

Advanced Turbomachinery Analysis Training Main Topics:

- Introduction to Turbomachinery
- Measurement Sensors & It's Application
- Journal Bearings Types, Design & Selection
- Phase Measurement & Analysis
- Orbit and Average Shaft Center Line Plot
- Full Spectrum Plots Analysis
- Transient State Plots Analysis
- Trend Plot Analysis
- Rotor Dynamics
- Turbomachinery Malfunctions
- ISO Standard
- Turbomachinery Diagnostics Case Studies



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certification

Advanced Machinery Balancing

A Three Days course intended to provide all technical information for advanced levels of rotating machinery balancing and field applications.



Online Interactive Course

Attend the training anywhere world-wide,
without travelling expenses



Hardcopy References & Balancing Software

Acquire text book & software for single and
multi-plane balancing



Practitioner Instructor

Gain wide practical experience based on
hundreds of balancing cases

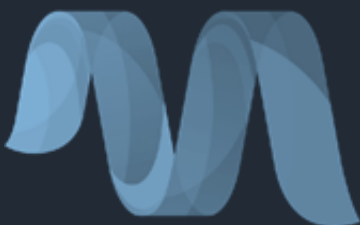


Practical Course

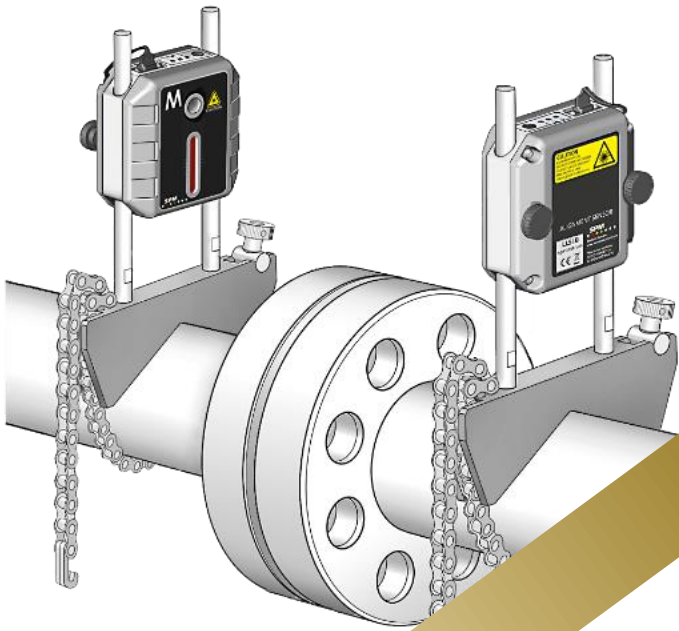
The most practical course to learn all
tricks you need to do balancing

Training Main Topics:

- Introduction
- Phase Analysis
- Balancing diagnostics
- Single & Two Plane Balancing
- Balancing using amplitude only.
- Balancing using influence coefficient
- One shot Balancing.
- Balancing Mode shapes.
- Workshop Balancing.
- Balancing diagnostics for fans and turbines
- Correction weight location using vectors and polar plot
- Balancing method using polar plots.
- Trail weight calculation and estimation
- ISO standards.
- Case studies for (Motors, Fans, Blowers, Crushers, Pumps, and Turbine Balancing)



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MDI – Machinery Diagnostics
Institute
The training provider for Advanced
Turbomachinery Analysis training
course and certification

Precision Shaft Alignment

Proper machine inspections and preparation are essential to identify underlying machinery and foundation issues that may impact machinery operation and reliability.

This course focuses on the fundamental concepts and skills required to perform precision alignment with today's laser alignment systems.



Online Interactive Course

Attend the training anywhere world-wide, without travelling expenses



Hardcopy References

Acquire text book for precision alignment steps and tricks



Practitioner Instructor

Gain wide practical experience based on hundreds of shaft alignment cases

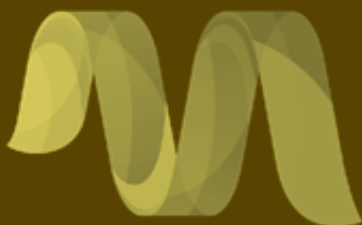


Practical Course

The most practical course to learn all tricks you need to do alignment

PSA - Training Main Topics:

- Introduction to Misalignment
- Consequences of misalignment
- Misalignment Types
- Introduction to Couplings
- Alignment Preparation Procedures
- Machine Soft Foot
- Alignment Methods: Precision Ruler
- Alignment Methods: Dial Indicator
- Alignment Methods: Laser Alignment
- Laser Alignment Software
- Tolerance of Alignment
- Diagnosing Misalignment



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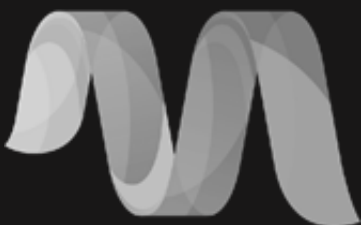
Asset Reliability Practitioner – A

The course is intended for senior management, maintenance and operations / production management, reliability engineers, and condition monitoring professionals who need to understand the “big picture” of the reliability and performance improvement process.

It will provide a memorable explanation of how & why to improve reliability & performance.

ARP – A – Training Main Topics:

- Reliability Benefits
- Assessing Your Benefits
- Culture Change
- Selling Senior Management
- Strategy [Plan/Mission/Vision/Team/Support]
- Understanding Failure
- Defect Elimination [DFR/Procurement/Acceptance Testing/Operators]
- Asset Strategy [RTF/CBM/IBM, ACR, BOM/MOC, FMEA/RCM/PMO, RCA]
- Work Management
- Spares Management
- Precision And Proactive Work [Lubrication/alignment/balancing/fastening]
- Condition Monitoring Techniques [CBM/VA/OA/UT/WPA/MCE/IR/More]
- Breaking Out of Reactive Maintenance
- Continuous Improvement [KPIs/Benchmarking/Education]



Meet Our Instructors

Salah Attia

Machinery Diagnostics International Consultant

Salah Attia is one of few machinery diagnostics international consultants, Who played a critical rule in each leading company he worked with in Arabian Gulf, Egypt and Australia.

He has more than 15 years of experience in rotating machinery diagnostics services, troubleshooting and condition monitoring techniques in multinational organizations.



Currently he is acting as a Technical Consultant & Instructor at MDI –Australia.

Salah is ISO 18436-2 CAT IV certified Vibration Analyst and approved instructor from Mobius Institute.



Aly Attia

Machinery Diagnostics Engineer

Aly Attia is a Condition Monitoring Engineer, having a major experience in Rotating Machinery Diagnostics and accredit instructor for Thermography & Machinery Lubrication.

A real practitioner who carry out rotating machinery diagnostics using condition monitoring techniques for different industries heavy to medium ranges.

Wide practical experience based on hundreds of diagnostics cases, in the fields of Oil & Gas, Power Generation, Refineries, Petrochemicals, Cement, Steel and Fertilizers. Aly is ISO 18436-2 CAT IV certified Vibration Analyst and accredit instructor for Machinery Lubrication, Vibration Analysis & Thermography.



Gain Accredit Certification



All of MDI – Machinery Diagnostics Institute courses are ISO 18436-4 compliant and following its standard. Our accredit courses allow you to apply for certification exams of the most recognized certification providers world-wide.



MDI – Machinery Diagnostics Institute courses provides the best practical experience based on hundreds of case studies, learn all tricks you need to do the job efficiently.

Class Room / Online Technical Training

