MACHINERY VIBRATION ANALYSIS (MVA)

VIBRATION ANALYST CERTIFICATION CATEGORY III

ISO 18436-2:2014 CAT III

📅 **Course Period** : 5 Consecutive Days

📝 **VCAT III Exam** : 5th Day

HRDC CLAIMABLE COURSE

HRD CORP CLAIMABLE

REGISTERED HRD CORP TRAINING PROVIDER

CERTIFICATION BY

Vibration Institute

LUBETRAIN RESOURCES SDN BHD
www.lubetrainresources.com

introduction

machinery vibration analysis (mva)

The Vibration Institute's Certification Program for Vibration Analysts is an ANAB - accredited personnel certification program that meets the highest international standards for impartiality and technical competence. As a third-party certification body defined under ISO/IEC 17000, the Institute conducts independent conformity assessments in vibration condition monitoring and diagnostics. Accredited to ISO/IEC 17024 by the ANSI National Accreditation Board (ANAB), the program also complies with ISO 18436-1 and ISO 18436-2. Widely recognized as a benchmark of professional excellence, it is the only vibration analyst certification program accredited by ANAB, setting the standard for credibility, industry relevance, and trust in the field.

is an advanced-level training course developed to build upon foundational vibration knowledge and prepare participants for complex condition monitoring and diagnostic tasks. The course delivers 38 hours of training and serves as partial preparation for the ISO 18436-2:2014 Vibration Analyst Category III Certification Exam. Topics include time waveform interpretation, FFTs, phase and orbit analysis, fault detection, machinery severity assessment, and single-plane balancing.

Designed to be interactive and practical, the course incorporates instructor-led demonstrations, guided exercises, and real-world case studies. Each chapter includes a 12-question workshop to reinforce key concepts, followed by class reviews to deepen understanding. This structure ensures participants gain both the theoretical background and practical readiness required for advanced on-the-job application and exam success.

training objectives

They **shall** be qualified to design, direct, and manage condition monitoring programs. They **shall** be capable of applying alternative condition monitoring technologies to validate or further investigate machinery issues. Category III Analysts **shall** also be able to lead corrective actions such as rotor balancing and **shall** have the authority to recommend operational restrictions when necessary to ensure machine reliability and safety.

They **shall** possess all the knowledge and skills of a Category II Analyst and **shall** be capable of providing technical guidance and instruction to lower-level analysts. They **shall** demonstrate in-depth understanding of vibration analysis techniques, including single-channel spectra, time waveforms, orbits, operating deflection shapes, and acceleration enveloping. They **shall** be able to conduct non-routine fault diagnoses and accurately interpret complex vibration data.

category III certified vibration analysts

course outline[1]

Signal Processing

Instrumentation, Digital Signal Processing, Resolution, Dynamic Range, Demodulation, Data Displays.

Principles of Vibration

The Physical Nature of Vibration, Vibratory Motion, Degrees of Freedom, Measures & Magnitudes, Relationships of Displacement, Velocity and Acceleration.

Data Acquisition Procedures

Accelerometers, Velocity Sensors, Proximity Probes, Encoders, Signal Conditioning, Triggering and Calibration.

Frequency and Phase Analysis

Frequency Analysis, Beats, Orders, Nonsynchronous Frequencies, Resonance, Sidebands, Modulation and Spectral Shapes.

Time Waveform Analysis

Signal Processing and Presentation, Phase Measurement and Analysis, Harmonic Relationships, and Time Waveform Shape Analysis.

Machine, Components, and Potential Fault Frequencies

common or shared fault frequencies, fluid film bearings, rotors, rolling element bearings, gearboxes, motors, generators, pumps, fans, compressors, belt and roll frequencies.

Machine Testing

Concepts, Mode Shapes, Shaker Excitation, Impact Testing, Damping, Amplification and Critical Speed Testing.

course outline₂

Orbit Analysis & Shaft Centerline Position

Orbital Construction, Orbital Timing, Orbital Analysis, Centerline Position, and Case Histories.

Balancing of Rotating Machinery

Mass Unbalance, Force, Single Plane Balancing, Critical Speeds, Trial Weights, Pitfalls, One Shot Methodology, and Four Run Method.
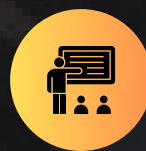
Condition Monitoring and Evaluation

Machine Knowledge, Types Of Monitoring, Route Based, Permanent Monitoring, Protection, Screening and Trending.

# how to become a certified vibration analyst category III

1. Education

There is no formal education requirement to sit for the certification exam per ISO 18436-2; however, candidates should be able to perform basic algebra, use a scientific calculator, and be computer literate. A 2-year degree in mechanical engineering technology is recommended for Category III candidates.

2. Experience

Candidates must have a minimum of 36 months of experience in machinery vibration condition monitoring and diagnostics. Proof of experience is required to sit for the certification exam.

3. Training

Candidates must complete a minimum of 38 hours of formal training plus hold a valid Category II certification, as outlined in ISO 18436-2. Training must be provided by an ISO 18436-3 compliant provider, with documented proof required to sit for the Category III exam.
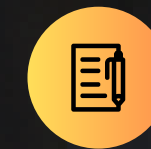
4. Examination

The exam has 105 multiple-choice questions to be completed in 4 hours, covering concepts from ISO 18436-2. It is closed-book, with no reference materials or scrap paper allowed. A basic, non-programmable calculator is recommended. Passing scores vary by exam and are set using the Angoff Method. Some questions may be unscored beta items.

who should attend

Certified Category II vibration analysts seeking advanced certification.

Senior condition monitoring or reliability engineers managing vibration programs.

Supervisors or team leads overseeing vibration analysis teams.

Professionals diagnosing complex machinery faults using advanced techniques (e.g. orbits, ODS, phase analysis).

Engineers responsible for corrective actions like rotor balancing and recommending operational changes.

Those involved in root cause failure analysis or plant performance improvement initiatives.