

## COURSE OVERVIEW RE0802-4D Vibration Level I (Mobius Institute)

### Course Title

Vibration Level I (Mobius Institute)

### Course Date/Venue

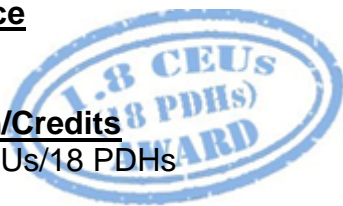
October 20-24, 2024/SAS Meeting Room, Holiday Inn Muscat al Seeb, an IHG Hotel, Muscat, Oman

### Course Reference

RE0802-4D

### Course Duration/Credits

Four days/1.8 CEUs/18 PDHs



### Course Description



***This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.***

Category I is the ideal starting place for new vibration analysts, those who are collecting data and those who want a better understanding of vibration analysis and condition monitoring. Participants will have a solid understanding of why we monitor the condition of rotating machinery and other critical assets, the importance of improved reliability and how vibration can be successfully measured and analyzed to provide an early warning of a wide range of fault conditions.

This course is designed to provide participants with a detailed and up-to-date overview of ISO Vibration Analyst Category I in accordance with ISO 18436-2. It covers the maintenance practices and condition monitoring; the principles of vibration, vibration measurement, time waveform and spectrum; the brief introduction to phase and signal processing; the vibration analysis and spectrum analysis process; the quick introduction of resonance; diagnosing of common fault conditions covering unbalance, misalignment, rolling element bearing failure, looseness and resonance; and setting alarm limits.

## Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get certified as a “*Vibration Analyst: Category I*” in accordance with ISO 18436-2 standards from Mobius Institute
- Carryout reactive, preventive, condition-based and proactive maintenance practices
- Employ condition monitoring and ultrasound, infrared, oil analysis, wear particle analysis and electric motor testing
- Discuss the principles of vibration comprising of waveforms and metrics
- Apply vibration measurement through vibration sensors, vibration units, mounting, naming conventions, repeatability and quality, vibration axes, routes and detecting and avoiding poor data
- Explain time waveform, spectrum, forcing frequencies and phase
- Illustrate signal processing covering analyzer settings, Fmax, resolution and spectral averaging
- Apply vibration analysis, diagnosing common fault condition and setting alarm limits

## Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.

## Who Should Attend

This course provides an overview of all significant aspects and considerations of ISO vibration analysis for maintenance, reliability, rotating equipment, process, control and instrumentation personnel who are willing to gain, improve and/or update their knowledge and skills of practical aspects of machinery vibration monitoring, analysis and predictive maintenance. Mechanical and electrical engineers, maintenance supervisors, electrical supervisors, mechanical supervisors, mechanical foremen, specialists and other technical staff will also benefit from this course.

## Exam Eligibility & Structure

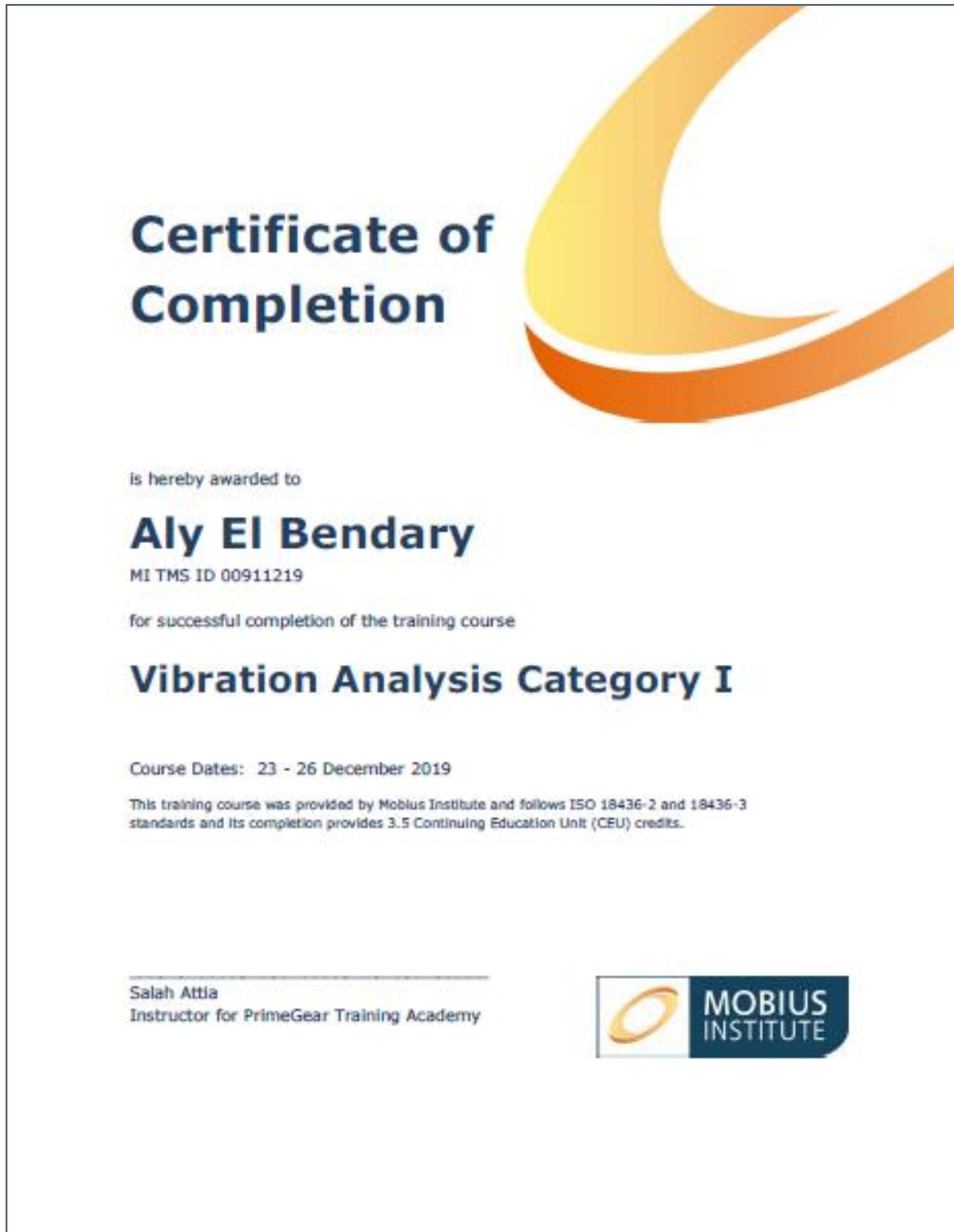
Exam candidates shall have the following minimum prerequisites:-

- At least Secondary School Graduation Diploma or its equivalent
- Minimum 6 months of Vibration Analysis experience, verified by an independent person
- Pass the exam



**Course Certificate(s)**

- (1) Internationally recognized certificates will be issued to all participants of the course.





- (2) Mobius Institute will certify the participants who will pass the examination for **Vibration Analyst: Category I**







- (3) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

\* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \*



**Haward Technology Middle East**  
Continuing Professional Development (HTME-CPD)



## CEU Official Transcript of Records

**TOR Issuance Date:** 14-Nov-22  
**HTME No.** 74852  
**Participant Name:** Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
RE0802-4D	ISO 18436 Category 1 Basic Vibration Analyst Training & Certification	November 11-14, 2022	14	1.4

**Total No. of CEU's Earned as of TOR Issuance Date** **1.4**

**TRUE COPY**  
  
**Jaryl Castillo**  
 Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by










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\* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \*



## Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

- 
The International Accreditors for Continuing Education and Training (IACET - USA)


Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **1.8 CEUs** (Continuing Education Units) or **18 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

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Mobius Institute Board of Certification (MIBoC) Scheme

Mobius Institute Board of Certification (**MIBoC**) is ISO/IEC 17024 and ISO 18436-1 accredited and provides globally recognised certification for Vibration Analysis, Infrared Thermography, Ultrasound and Asset Reliability. MIBoC is an impartial and independent entity that is directed by scheme and technical committees to ensure that its certification meets or exceeds the requirements defined by the applicable ISO standards. Haward Technology is a partner of various Mobius Training Partners.



### Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



**Mr. Anil Lakhlan**, BSc, CAT-III, is a **Senior Maintenance & Reliability Engineer** with extensive years of experience within the **Oil & Gas, Refinery and Petrochemical** industries. His expertise widely covers in the areas of **Advanced Vibration Analysis, Piping Vibration Analysis & Troubleshooting, Vibration Techniques, Acoustic & Flow Induced Vibration, Rotary & Vibration Inspection, Dynamic Balancing, Rotor Balancing**, Maintenance of **Rotating Machines, Mechanical Shaft Alignment, Condition Monitoring & Asset Management, IIOT Wireless Monitoring Solutions, Wireless & Wired Monitoring Technology, Asset Reliability & Lubrication, Lubrication Management, Oil Analysis, Non-Destructive Testing (NDT), Leak Detection, False Air Detection, Laser Alignment, SAP, Rotating Equipment Maintenance & Failure Analysis, Gas Turbine Failure Analysis, Rotating Equipment for Pumps, Compressors, Extruder, Vibration & Alignment, Risk Analysis, Practical Machinery Vibration Monitoring, Machinery Maintenance, Advanced Centrifugal Pumps, Compressor Analysis, Pump Vibration Testing & Analysis, Failure Mode Effect Analysis (FMEA), Thermography, Thermal Power Plant Operation & Maintenance** and experienced in CBM tools such as SENSOTEQ, FAG, PRUFTECHNIK, COMTTEST, MODSONIC, SKF, FLIR, SDT, CRYSTAL and ERBESSD. Further, he is also well-versed in **Electrical Installation, Maintenance & Troubleshooting, LV/MV Electric Power Systems, Transformer Testing & Analysis, Power Plant Systems, Condition Monitoring of Power System Equipment, Power System Analysis and Power Flow Analysis.**

During his career life, Mr. Anil has gained his practical and field experience through his various significant positions and dedication as the **Regional Manager, Business Development CBM Services & Products, Condition Monitoring Specialist, Condition Based Maintenance (CBM) Service Engineer, Senior Engineer, Service Engineer and Data Collector** for numerous international companies such as the SENSOTEQ LTD, SAMIR ODEH & SONS, Al Ain Cement Factory, Ultratech Cement LTD. (ABG GROUP), Abro Technologies PVT. LTD. and TEAMLEASE – SKF INDIA LTD, just to name a few.

Mr. Anil has a **Bachelor's degree in Electronics & Communication Engineering.** Further, he is a **Certified Instructor/Trainer**, an **Authorized Mobius Trainer for Vibration Analyst (CAT I, II & III)**, a **Certified Vibration Analyst (CAT-III)** from **Mobius Institute** and a **Certified ASNT-NDT Level I Inspector** in Ultrasonic Testing (UT). He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.



### Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

### Course Fee

**US\$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

### Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

### Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

#### **Day 1: Sunday, 20<sup>th</sup> of October 2024**

0900- 0930	Registration & Coffee
0930 - 0945	Welcome & Introduction
0945 - 1000	<b>PRE-TEST</b>
1000 - 1100	<b>Maintenance Practices</b> Reactive, Preventive, Condition-Based, Proactive • How to Decide Between Them
1100 - 1115	Break
1115 - 1200	<b>Condition Monitoring</b> Why It Works • Ultrasound, Infrared, Oil Analysis, Wear Particle Analysis & Electric Motor Testing
1200 - 1300	Lunch
1300 - 1400	<b>Principles of Vibration</b> Waveforms
1400 - 1415	Break
1415 - 1520	<b>Principles of Vibration (cont'd)</b> Metrics: Overall Levels, RMS, PK, PK-to-Peak & Crest Factor
1520 - 1530	<b>Recap</b>
1530	End of Day One

#### **Day 2: Monday, 21<sup>st</sup> of October 2024**

0900 - 1030	<b>Introduction to Vibration Measurement</b> Vibration Sensors: Displacement, Velocity & Acceleration • Vibration Units
1030 - 1045	Break





1045 - 1200	<b>Introduction to Vibration Measurement(cont'd)</b> Mounting: Where & How? • Naming Conventions
1200 - 1300	Lunch
1300 - 1400	<b>Introduction to Vibration Measurement(cont'd)</b> Repeatability & Quality • Vibration Axes: V, H, A & T
1400 - 1415	Break
1415 - 1520	<b>Introduction to Vibration Measurement(cont'd)</b> What are "Routes" & How do you Create Them? • Detecting & Avoiding Poor Data
1520 - 1530	<b>Recap</b>
1530	End of Day Two

**Day 3: Tuesday, 22<sup>nd</sup> of October 2024**

0900 - 1030	<b>An Introduction to the Time Waveform</b>
1030 - 1045	Break
1045 - 1200	<b>An Introduction to the Spectrum</b> Introduction to Forcing Frequencies
1200 - 1300	Lunch
1300 - 1400	<b>A Brief Introduction to Phase</b>
1400 - 1415	Break
1415 - 1520	<b>A Brief Introduction to Phase (cont'd)</b>
1520 - 1530	<b>Recap</b>
1530	End of Day Three

**Day 4: Wednesday, 23<sup>rd</sup> of October 2024**

0900 - 1030	<b>Signal Processing (Just the Absolute Basics)</b> A Quick Tour of your Analyzer Settings • Fmax
1030 - 1045	Break
1045 - 1200	<b>Signal Processing (Just the Absolute Basics) (cont'd)</b> Resolution • Spectral Averaging
1200 - 1300	Lunch
1300 - 1400	<b>Vibration Analysis</b> The Spectrum Analysis Process
1400 - 1415	Break
1415 - 1520	<b>What is Resonance? A Quick Introduction</b>
1520 - 1530	<b>Recap</b>
1530	End of Day Four

**Day 5: Thursday, 24<sup>th</sup> of October 2024**

0900 - 0930	<b>Diagnosing Common Fault Conditions</b> Unbalance • Misalignment • Rolling Element Bearing Failure • Looseness • Resonance
0930 - 0945	Break
0945 - 1115	<b>Setting Alarm Limits</b>
1115 - 1130	Break
1130 - 1200	<b>Review</b>
1200 - 1300	Lunch
1300 - 1500	<b>Vibration Institute Category I Exam (2 Hours)</b>
1500 - 1515	<b>Course Conclusion</b>
1515 - 1530	Presentation of Course Certificates
1530	End of Course



**Simulator (Hands-on Practical Sessions)**

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the state-of-the-art simulator “iLearnVibration”.



**Course Coordinator**

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