COURSE OVERVIEW RE0626-4D

Certified Machine Lubricant Analyst (MLA) Level-II

ISO 18436-4/ICML Certification

Course Title

Certified Machine Lubricant Analyst (MLA) Level-II: *ISO 18436-4/ICML Certification*

Course Date/Venue

Session 1: August 05-08, 2024/Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA
Session 2: August 11-14, 2024/Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA

2.4 CEUs (24 PDHs) AWARD

H-STK© INCLUDED

Course Reference

RE0626-4D

Course Duration/Credits

Four days/2.4 CEUs/24 PDHs

Online Exam Window

As per ICML Schedule

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Certified Machine Lubricant Analyst (MLA) Level-II. It covers the lubricant roles and functions including base oil, additive functions, synthetic lubricants and lubrication regimes; the oil analysis maintenance strategies and the fundamental aspects of reliability-centered maintenance (RCM) and condition-based maintenance (CBM); and the oil sampling and objectives for lube oil sampling, equipment specific sampling, sampling methods, managing interference and sampling process management.

During this interactive course, participants will learn the lubricant health monitoring, lubricant failure mechanisms, oxidative and thermal degradation; the additive depletion or degradation; testing for wrong or mixed lubricants; the fluid properties test methods and measurement units; the lubricant contamination measurement and control covering particle contamination, moisture contamination, glycol coolant contamination, soot contamination, fuel contamination and air contamination; and the wear debris monitoring and analysis comprising of common wear mechanisms, detecting abnormal wear and wear debris analysis.

Course Objectives

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

- Get certified as a *"Machine Lubricant Analyst (MLA) Level - II"* from the International Council for Machinery Lubrication (ICML) in accordance with the ISO 18436-4 standard
- Discuss lubricant roles and functions including base oil, additive functions, synthetic lubricants and lubrication regimes
- Carryout oil analysis maintenance strategies and recognize the fundamental aspects of reliability-centered maintenance (RCM) and condition-based maintenance (CBM)
- Perform oil sampling and describe the objectives for lube oil sampling, equipment specific sampling, sampling methods, managing interference and sampling process management
- Apply lubricant health monitoring and determine lubricant failure mechanisms, oxidative and thermal degradation as well as additive depletion or degradation
- Test for wrong or mixed lubricants and identify the fluid properties test methods and measurement units
- Employ lubricant contamination measurement and control covering particle contamination, moisture contamination, glycol coolant contamination, soot contamination, fuel contamination and air contamination
- Implement wear debris monitoring and analysis comprising of common wear mechanisms, detecting abnormal wear and wear debris analysis

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 is providing an overview of all significant aspects and considerations of machine lubrication analysis for plant engineers, reliability engineers, condition monitoring specialist, plant managers, operations managers, plant operators and lubrication and maintenance technical staff.

Course Fee

US$ 7,000 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.

Exam Eligibility & Structure

Exam Candidates shall have the following minimum prerequisites:-

- **Education and/or Experience** - Candidate must have 24 months experience in the field of lubricant-analysis-based machinery condition monitoring (based on 16 hours minimum per month of experience). This represents a minimum of 384 hours spread consistently over two years.
- **Complete one of these requirements:**
  - Hold Level I Machine Lubricant Analyst (MLA) certification

    OR

  - Qualify as a Mature Entry Candidate (without Level I MLA certification) by submitting documentation of:
    - At least 576 hours additional work experience in the field of lubricant-analysis-based machinery condition monitoring. This brings total work hours to 960 when combined with the 384 hours already listed above.
    - Minimum 24 hours training relevant to the MLA I Body of Knowledge, accumulated through any combination of instructor-led events (such as workshops, seminars, or classes) and/or specific hands-on practice or observation.
- **Training** - Candidate must have received 24 hours of documented formal training as outlined in the Body of Knowledge of the MLA II. For online or recorded training, exercises, lab tasks, practice exams, and review exercises may be included in the training time total but shall not exceed four hours of the required course time. These 24 hours are in addition to the previous 24 hours of training required for MLA I or Mature Candidate Entry, for a total cumulative training of 48 hours. Candidate shall be able to provide a record of this training to ICML that shall include the candidate's name, the name and signature of the instructor, the dates of the training, and the number of hours spent in the training.
- **Examination** - Each candidate must successfully pass a 100-question multiple choice examination that evaluates the candidate's knowledge of the topic. Candidates have three hours to complete the closed-book examination. A score of 70% is required to pass the examination and achieve certification.

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 Certificate(s)

(1) ICML certificates will be issued to participants who have successfully completed the course and passed the exam. Successful candidate will be certified as *"Machine Lubricant Analyst (MLA) Level - II*".

International Council for Machinery Lubrication

Martin Williamson

has satisfactorily fulfilled the requirements established by the Council for professional attainment in

Machinery Lubricant Analysis

and, is therefore designated by the Council as a:

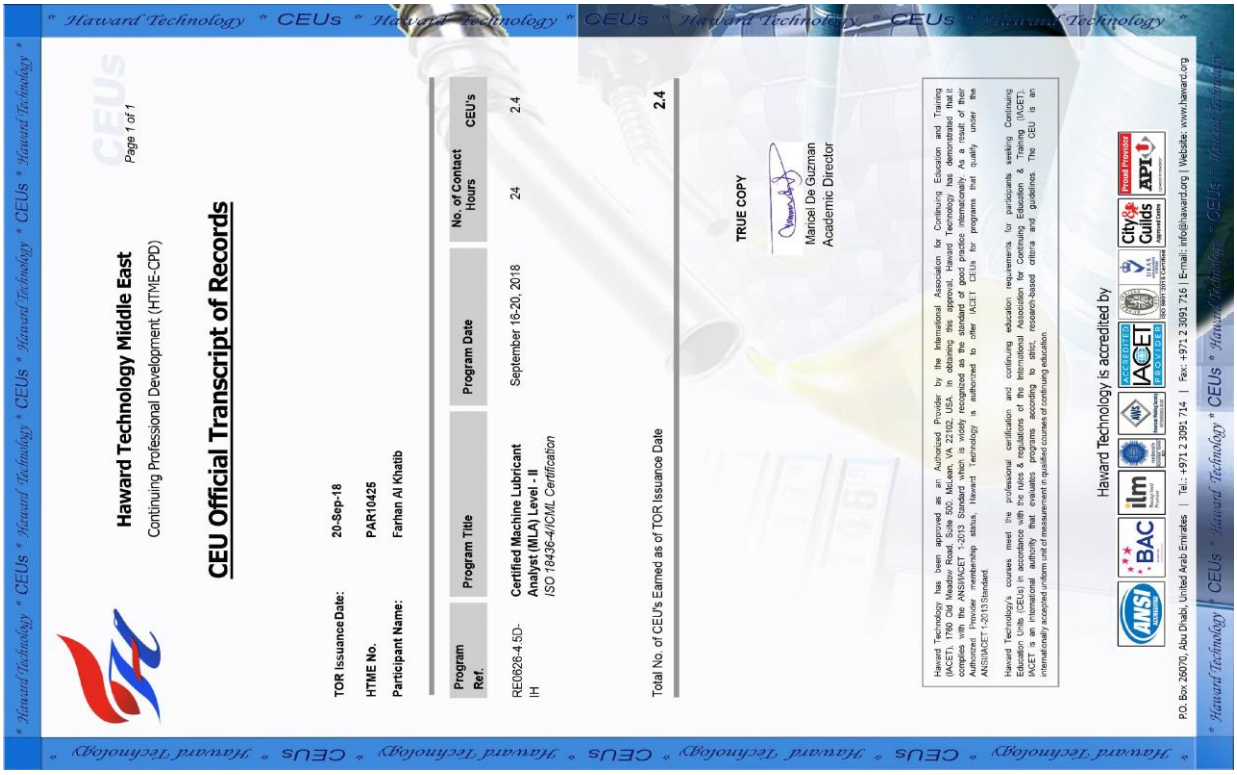
Certified Level II Machinery Lubricant Analyst
ISO Equivalency: ISO 18436-4, Category II

Certification Number: MLA II-002415
Certification Date: 6/15/2005
Re-certify By: 6/15/2017

Leslie Fish
Certification Director

By issuing this certificate, ICML attests to the qualification of the holder as defined in ISO 18436-4, Category II but does not give any authority to perform machinery lubricant sampling or analysis

(2) 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 Middle East
Continuing Professional Development (HTME-CPD)

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CEU Official Transcript of Records

TOR Issuance Date: 20-Sep-18
HTME No. PAR10425
Participant Name: Farhan Al Khatib

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
RE0626-4 5D-IH	Certified Machine Lubricant Analyst (MLA) Level - II *ISO 18436-4/ICML Certification*	September 16-20, 2018	24	2.4

Total No. of CEU's Earned as of TOR Issuance Date 2.4

TRUE COPY

Maricel De Guzman
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102, 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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Certificate Accreditations

Haward Technology is accredited by the following international accreditation organizations:-

- International Council for Machinery Lubrication (ICML)

  This Machine Lubricant Analyst Certification course complies with the **ICML** (**International Council for Machinery Lubrication**) regulation and is designed to certify successful participant as a Machine Lubricant Analyst (MLA).

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

- 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.

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. Vivek Opal, PhD (on going), MSc, BSc, ICML, MLA III, is an **International ICML Authorized Instructor & Consultant** with almost **20** years of practical experience within the **Oil & Gas** and **Petrochemical** industry. His wide expertise covers in the areas of **Machinery Lubrication**, **Condition Monitoring**, **Vibration & Oil Analysis**, **Contamination Monitoring, Tribology**, **Reliability Engineering** and **Scheduling Design**, **Oil & Petroleum Analysis**, **Lube & Transformer** Asset Management, **Machinery Lubrication**, **Greasing & Oil Sampling**, **Crude** Analysis, **Calibration & Troubleshooting** of all Equipment and QC Procedures, Laboratory Automation and **Quality Assurance & Quality Control**. Further, he is also well-versed in Laboratory Commissioning, Lab Management, Quality & HSE Management, Project Management, Manpower Management, Customer Relationships, Bids & Tenders, CAPEX and PNL Management, Process & Method Developments, Process Enhancements & Innovation and Cross Functional Coordination.

During his career life, Mr. Vivek has gained his practical and field experience through his various significant positions and dedication as the **Laboratory Manager**, **Technical & Quality Manager**, **QA/QC Laboratory Supervisor**, **Team Leader** (**O&P**) **& Lead Lubricant Diagnostician**, **Senior Petroleum Chemist & OCM Diagnostician**, **Senior QA/QC Executive**, **Senior Quality R&D Chemist**, **Assistant Manager** and **Senior Instructor/Trainer** for Intertek Caleb Brett, Bureau Veritas Commodities Division, AVT McCORMICK Ingredients PVT LTD, Gulf Petromin Lubricants and J&J Biotech & Speciality Chemicals (P) LTD.

Mr. Vivek has **Master's** and **Bachelor's** degree in **Chemistry**. Further, he is a **Certified ICML - MLA III** (Machinery Lubricant Analyst), an **Associate Member** of the **Board** of the **ICML** and an **Internal Auditor** of ISO/IEC 17025:2017, ISO/IEC 17020:2012, ISO 9001:2015, ISO 14001:2015 and ISO 45001: 2018. He is also a **Certified Instructor/Trainer** and delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0815 – 0930	***Lubricant Roles & Functions*** *Base Oil (Functions, Properties) ● Additive Functions (Surface Active Additives & their Functions; Bulk Oil Active Additives & their Functions) ● Synthetic Lubricants (Synthetic Lubricant Types, Conditions Dictating their Use) ● Lubrication Regimes (Hydrodynamic, Elasto-Hydrodynamic, Boundary)*

0930 – 0945	*Break*
0945 – 1045	***Oil Analysis Maintenance Strategies*** *Fundamental Aspects of Reliability-Centered Maintenance (RCM) ● Fundamental Aspects of Condition-Based Maintenance (CBM) (Predictive Maintenance Strategies, Proactive Maintenance Strategies)*
1045 – 1215	***Oil Sampling*** *Objectives for Lube Oil Sampling ● Equipment Specific Sampling (Gearboxes with Circulating Systems, Engines, Single & Multi-Component Circulating Oil Systems with Separate Reservoirs, Hydraulic Systems, Splash, Ring and Collar Lubricated Systems)*
1215 – 1230	*Break*
1230 – 1420	***Oil Sampling (cont'd)*** *Sampling Methods (Non-Pressurized Systems, Pressurized Systems – Low, Pressurized Systems – High)*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Oil Sampling (cont'd)*** *Managing Interference (Bottle Cleanliness & Management, Flushing, Machine Conditions Appropriate for Sampling)*
0930 – 0945	*Break*
0945 – 1125	***Oil Sampling (cont'd)*** *Sampling Process Management (Sampling Frequency, Sampling Procedures, Sample Processing)*
1125 – 1215	***Lubricant Health Monitoring*** *Lubricant Failure Mechanisms ● Oxidative Degradation (The Oxidation Process, Causes of Oxidation, Effects of Oxidative Degradation) ● Thermal Degradation (The Thermal Failure Process, Causes of Thermal Failure, Effects of Thermal Degradation)*
1215 – 1230	*Break*
1230 – 1420	***Lubricant Health Monitoring (cont'd)*** *Additive Depletion/Degradation (Additive Depletion Mechanisms, Additives at Risk for Depletion/Degradation by the Various Mechanisms) ● Testing for Wrong or Mixed Lubricants (Baselining Physical and Chemical Properties Tests, Additive Discrepancies)*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Lubricant Health Monitoring (cont'd)*** *Fluid Properties Test Methods and Measurement Units (Kinematic Viscosity (ASTM D445), Absolute (Dynamic) Viscosity (ASTM D2983), Viscosity Index (ASTM D2270), Acid Number (ASTM D974 et al), Base Number (ASTM D974 et al), Fourier Transform Infrared (FTIR) Analysis, Rotating Pressure Vessel Oxidation Test (ASTMD2272), Atomic Emission Spectroscopy)*

0930 – 0945	*Break*
0945 – 1100	***Lubricant Contamination Measurement & Control*** *Particle Contamination (Effects on the Machine, Effects on the Lubricant, Methods and Units for Measuring Particle Contamination, Techniques for Controlling Particle Contamination) ● Moisture Contamination (Effects on the Machine, Effects on the Lubricant, States of Coexistence, Methods and Units for Measuring Moisture Contamination, Demulsibility Measurement, Techniques for Controlling Moisture Contamination)*
1100 – 1215	***Lubricant Contamination Measurement & Control (cont'd)*** *Glycol Coolant Contamination (Effects on the Machine, Effects on the Lubricant, Methods and Units for Measuring Glycol Contamination, Techniques for Controlling Glycol Contamination)*
1215 – 1230	*Break*
1230 – 1420	***Lubricant Contamination Measurement & Control (cont'd)*** *Soot Contamination (Effects on the Machine, Effects on the Lubricant, Methods and Units for Measuring Soot Contamination, Techniques for Controlling Soot Contamination) ● Fuel Contamination (Fuel Dilution in Oil) (Effects on the Machine, Effects on the Lubricant, Methods and Units for Measuring Fuel Contamination, Techniques for Controlling Fuel Contamination)*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0900	***Lubricant Contamination Measurement & Control (cont'd)*** *Air Contamination (Air in Oil) (Effects on the Machine, Effects on the Lubricant, States of Coexistence, Methods for Assessing Air Contamination [Air Release Characteristics (ASTM D3427); Foam Stability Characteristics (ASTM D892)], Techniques for Controlling Air Contamination)*
0900 – 0915	*Break*
0915 – 1145	***Wear Debris Monitoring & Analysis*** *Common Wear Mechanisms (Abrasive Wear [Two-body; Three-body]; Surface Fatigue (Contact Fatigue) [Two-body; Three-body]; Adhesive Wear; Corrosive Wear; Cavitation Wear)*
1145 – 1215	***Wear Debris Monitoring & Analysis (cont'd)*** *Detecting Abnormal Wear (Atomic Emission Spectroscopy Methods [Inductively Coupled Plasma (ICP) Spectroscopy; Arc-spark Emission Spectroscopy]; Wear Particle Density Measurement)*
1215 – 1230	*Break*
1230 – 1345	***Wear Debris Monitoring & Analysis (cont'd)*** *Wear Debris Analysis (Ferrogram Preparation; Filtergram Preparation; Light Effects; Magnetism Effects; Heat Treatment; Basic Morphological Analysis)*
1345 – 1400	***POST TEST***
1400 – 1415	***Course Conclusion***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

MOCK Exam

Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward's Portal. Each participant will be given a username and password to log in Haward's Portal for the MOCK Exam during the 7 days following the course completion. Each participant has only one trial for the MOCK exam within this 7-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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