



# **ADVANCED LUBRICATION MANAGEMENT ( MLA III )**

- ◆ **Learn from the world's leading experts**
- ◆ **Learn how to implement Best Practice management**
- ◆ **Achieve peer recognition**
- ◆ **Raise your lubrication management to World Class standards.**

## **2018 Course dates**

- ◆ 9 - 10 October
- ◆ ICML MLAIII - 11 October

## **Venue**

- ◆ The National Waterways Museum, Ellesmere Port, Cheshire, UK.

**An ICML certification course to help you:**

- ☑ **understand the advanced fundamentals of lubrication and oil analysis**
- ☑ **get more out of your lubrication strategy**
- ☑ **improve your oil analysis management success**
- ☑ **increase reliability**
- ☑ **increase profits and turnover**
- ☑ **improve your quality goals**
- ☑ **improve your health & safety success**
- ☑ **reduce your environmental impact**
- ☑ **ensure compliance with ISO9001/ISO55000**
- ☑ **design your own 'Best Practice' lubrication programme.**

**Reliability through Lubrication**



**KEW Engineering Ltd is pleased to bring you our course with a reliability focus, “Advanced Lubrication Management”, in line with the ICML certification structure.**

This course, based on our experience, is targeted at helping your company’s reliability drive in the areas of lubrication, oil analysis and contamination control.

The course not only covers the fundamentals in depth, but provides best practice solutions to ensure your plant achieves world class levels in lubrication management.

The course is designed to be interactive, and attendees will be encouraged to participate with questions and discussion. Worked examples and Case Studies will be a key part in this training.

The content covers the body of knowledge as laid out by the International Council for Machinery Lubrication (ICML) for Machine Lubricant Analyst Level III (MLAIII) certification. Get your staff qualified and on the road to achieving best practice and world class standards.

We look forward to having you join our course.

## Who Should Attend?

- ✓ Plant Engineers
- ✓ Reliability Engineers
- ✓ Lubrication Technicians
- ✓ Oil Analysis Practitioners
- ✓ Condition Monitoring Specialists
- ✓ Plant Operators
- ✓ Maintenance Technicians

**Whatever your industry, if you are involved in some way with lubricants, this course is for you!**

## Meet Your Expert Course Leader

**Martin Williamson** is a graduate Mechanical Engineer from the University of Cape Town and began his maintenance career working in the mining industry. This experience included condition monitoring with a focus on oil analysis and Tribology. In 1994, Martin joined Pall Filtration and provided technical support on their contamination monitoring instruments to clients in a variety of industries. He later joined Entek IRD to work in product management of their oil analysis tools, as well as providing a technical support role including training on oil analysis to international clients. For the last 10 years, he has been presenting training classes and undertaking consulting projects on an international level on behalf of Noria Corp and other key clients such as BP, Dow Corning, Marathon Oil and Cargill. He attained his CMRP (Certified Maintenance & Reliability Professional) status with SMRP (Society for Maintenance & Reliability Professionals) and has been involved with ICML (International Council for Machinery Lubrication), as well as working on various related ISO working groups. Martin is currently managing director of KEW Engineering Ltd.



# Course Content

## ◆ Lubrication Fundamentals

- ◆ Lubrication Regimes
  - ◆ Hydrodynamic
  - ◆ Elasto-hydrodynamic
  - ◆ Boundary
- ◆ Base oils
  - ◆ Common mineral oil characteristics
  - ◆ Common synthetic oil characteristics, advantages and disadvantages
- ◆ API and other base oil classifications
- ◆ Basic lubricant additive functions
  - ◆ Antioxidants/oxidation inhibitors
  - ◆ Rust inhibitors
  - ◆ Corrosion inhibitors
  - ◆ Demulsifying agents
  - ◆ Viscosity index (VI) improvers
  - ◆ Detergents
  - ◆ Dispersants
  - ◆ Pour-point depressants
  - ◆ Foam inhibitors
  - ◆ Anti-wear (AW) agents
  - ◆ Extreme pressure (EP) agents

## ◆ Fundamentals of Machine Wear

- ◆ Common Machine Wear Mechanism
  - ◆ Abrasive wear
  - ◆ Adhesive wear
  - ◆ Surface fatigue
  - ◆ Corrosive wear
  - ◆ Fretting wear
  - ◆ Erosive wear
  - ◆ Electrical wear
  - ◆ Cavitation wear
- ◆ Common Machine-specific Wear Modes
  - ◆ Gearing
  - ◆ Plain bearings
  - ◆ Rolling element bearings
  - ◆ Hydraulics

## ◆ Wear Debris Analysis

- ◆ Analytical ferrography
  - ◆ Wear debris analysis techniques
  - ◆ Wear particle types, origins and probable causes
- ◆ Atomic emission elemental spectroscopy
  - ◆ Basic determination of wear particle metallurgy from elemental composition
  - ◆ Evaluating sequential trends
  - ◆ Evaluating lock-step trends
  - ◆ Particle size limitations of common atomic emission spectrometers
  - ◆ Advanced techniques
  - ◆ X-ray fluorescence (XRF) and other advanced elemental spectroscopy methods

## ◆ Analysing lubricant degradation

- ◆ Oxidative base oil failure
  - ◆ Causes of oxidative base oil failure
  - ◆ Recognizing at-risk lubricants and applications
  - ◆ Strategies for deterring or mitigating base oil oxidation
  - ◆ Recognizing the effects of base oil oxidation
  - ◆ Strengths, limitations and applicability of tests used to detect and troubleshoot base oil oxidation
- ◆ Thermal failure of base oil
  - ◆ Causes of thermal degradation
  - ◆ Strengths, limitations and applicability of tests used to detect and troubleshoot thermal failure of the base oil

## ◆ Additive depletion/degradation

- ◆ Assessing risk for common additive depletion/degradation mechanisms
- ◆ Strengths, limitations and applicability of methods for measuring additive depletion/degradation
- ◆ Detecting wrong lubricant addition
  - ◆ Viscosity
  - ◆ Neutralization number (AN/BN)
  - ◆ Elemental spectroscopy
  - ◆ Fourier Transfer Infrared Analysis
  - ◆ Other Tests

## ◆ Oil analysis program development and program management

- ◆ Machine-specific test slate selection
- ◆ Optimizing frequency of analysis
- ◆ Setting alarms and limits
  - ◆ Setting goal-based limits for contamination
  - ◆ Statistically derived level limits using the mean and standard deviation
  - ◆ How changes in system operation or maintenance influence statistically derived inferences
  - ◆ Rate of Change Limits
  - ◆ Setting aging limits for fluid properties
  - ◆ Managing oil analysis information
  - ◆ Creating and managing oil analysis procedures
  - ◆ Scoping oil analysis training for reliability technician, trades people and management
  - ◆ Performing cost/benefit analysis for oil analysis and contamination control programs
    - ◆ Calculating program costs
    - ◆ Estimating program benefits
    - ◆ Calculating return on investment metrics
    - ◆ Generating an effective business proposal
- ◆ Quality Assurance:
  - ◆ Of onsite oil analysis
  - ◆ Of offsite oil analysis providers

# Get Qualified by the International Council for Machinery Lubrication



Transfer your skills to new career opportunities.

A qualification from ICML will aid compliance with your company's ISO 9001:2000 *Quality management systems - Requirements for training and qualification of personnel*.

The International Council for Machinery Lubrication, offering examinations which comply with the latest international standard ISO 18436-4:2008 *Condition monitoring and diagnostics of machines -- Requirements for qualification and assessment of personnel -- Part 4: Field lubricant analysis*.

Register online at for your MLA III examination at:

[www.lubecouncil.org](http://www.lubecouncil.org)  
Or call +1 918 259 2950

## Course Information

Our English language courses are taught exclusively by Martin Williamson.

- Please enquire for non-certification courses which can be modified to meet your specific needs and presented on-site.
- Please contact your local office for further information.

### 2018 Course dates (Tue - Thur + Friday)

- 9 - 10 October
- ICML MLAIII - 11 October

Please check our website to find out about other course dates with our training partners.

### Venue

The National Waterways Museum, Ellesmere Port, Cheshire.

### Costs

- £950.00 per person exc. VAT
- Group discounts available.
- ICML Exam fee - US\$275.00

Note. The ICML examination is optional and at additional cost

## What past attendees thought:



"Excellent information and real world examples. Good format allowed interaction within group"

**Mark Fleury, Owner, Fleury Engineering.**



"This course was well presented, the information was very interesting."

**Oliver Mangan, Fitter, Lagan Cement**

"Very good with lots of practical tips and insights. I have found this course very valuable, it has improved my knowledge immensely in the area of lubrication"

**Chris Abiodun, Reliability Engineer, BP**

"This is one of the best courses on the subject of lubrication I have ever attended with loads of practical information that could easily be implemented for equipment reliability improvement."

**Mohammad Naseer Uddin, Senior Reliability Engineer, PDO.**

## KEW Engineering Ltd.

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Our courses can be offered in English language in most countries. Please contact us to find out how our partners can offer local language courses in Japan, China and Malaysia.