

# Oil Analysis Workshop For Fast Response And Sustainable Programme



## OVERVIEW

Condition Monitoring (CM) is the process of monitoring a parameter of condition in machinery, such that a significant change is indicative of a developing failure. High system availability is the most effective lever for increasing productivity. The less downtime is the better. That is why it is important to identify potential sources of error early and to perform scheduled maintenance at the right time within the production cycle. **At CbM Solutions Sdn. Bhd. we have a philosophy we termed “Detect-to-Protect”.** Our training programme aims to increase level of awareness to allow for closer monitoring of heavy machineries to **detect** signs of issues that require further attention in order to **protect** the asset, reduce unpredicted equipment failure and down-time, improve equipment life and performance, **optimize efficiencies and maximize profit.** Our experienced facilitators will teach you on how to diagnostic data collection from many input such as vibration, ultrasound, infrared, oil, and others.

## LEARNING OUTCOME

At the end of this program, participants will be able to:

- Identify cases where oil analysis can be applied and areas that other CM such as **Vibration Analysis**, Thermography, **Acoustic Emission** and ultrasound are needed.
- Draw up a Cost vs. Benefit analysis to get buy-ins.
- List down various strategies for oil analysis and identify when it is applicable given the various scenarios.
- Identify pre-existing issues dampening a proper implementation of oil analysis, possible solutions and setting achievable goal/target.
- List various functions of lubricants and identify the key functions in variety of applications.
- Provide a basic idea how lubricant is made and list down possible base oils and additives being added and the functions of variety of additives.
- Classify various types of engine oils, cylinder oils, hydraulic oils, compressor oils, gear oils the similarities and differences in terms of functions and formulations.
- Understand various specifications of lubricants and knowing how to match with appropriate applications and conditions.
- Define parameters relevant in monitoring degradation of lubricants in various applications.
- Define parameters relevant in monitoring contaminants of lubricants and wear metals in various applications.
- Design suitable oil analysis programme relevant to the company.
- Understand condemning limits relevant to lubricant degradations, contaminations and wear
- Relate sequence of events that may occur during failure development related to oil analysis.
- Do a simple cross referencing within own pool of equipments.
- Able to identify key data and issues related to the case study.
- Know what is defined as good sample, where and how to take good oil sample.
- Present feasible plan to improve existing oil sampling programme.
- List various advance oil analysis techniques and relate to circumstances that requires it.
- List various circumstances that requires VA in-conjunction with OA.
- Identify circumstances that may require such technologies.
- Know what are routes for certification, should that become desired for personnel development.

## COURSE OUTLINE

### Day 1

1. 0800 – 0840 - Registration
2. 0850 – 0930 - Where does CM fit in your company KPI?
3. 0940 – 1020 - How does Oil Analysis fit in your overall CM programme?
4. 1020 – 1040 - Coffee Break
5. 1040 – 1120 - How does Oil Analysis fit in your overall CM programme?
6. 1130 – 1210 - Setting the objective(s) for Oil Analysis?
7. 1220 – 1300 - Various strategies in oil analysis?
8. 1300 – 1400 - Lunch Break
9. 1400 – 1530 - Challenges in implementing and sustaining an oil analysis programme
10. 1530 – 1550 - Tea Break
11. 1550 – 1630 - What are the functions of lubricants?
12. 1640 – 1720 - How lubricants formulated?

### Day 2

1. 0800 – 0840 - Engine Oils and Cylinder Oils
2. 0850 – 0930 - Hydraulic Oil and Turbine Oils
3. 0940 – 1020 - Compressor Oils and Gear Oils
4. 1020 – 1040 - Coffee Break
5. 1040 – 1120 - Making sure it is the right lubricant
6. 1130 – 1210 - Monitor level of degradation
7. 1220 – 1300 - Monitor level of contaminants
8. 1300 – 1400 - Lunch Break
9. 1400 – 1440 - Monitor Level of Wear
10. 1450 – 1530 - What to monitor in specific applications?
11. 1530 – 1550 - Tea Break
12. 1550 – 1720 - Degradation, contaminations and wear trends

### Day 3

1. 0800 – 0840 - What is the worst lubricant related failure that you had experienced?
2. 0850 – 0930 - Interlink between parameters and Cross Referencing & Setting Alarms
3. 0940 – 1020 - Case Study 1 (Engine Applications) and Case Study 2 (Turbine Applications)
4. 1020 – 1040 - Coffee Break
5. 1040 – 1120 - Case Study 3 (Gear Oils) and Case Study 4 (Hydraulic Oils)
6. 1130 – 1210 - Sampling
7. 1220 – 1300 - Do you have good sampling strategy?
8. 1300 – 1400 - Lunch Break
9. 1400 – 1440 - Further analysis
10. 1450 – 1530 - Integrating with VA
11. 1530 – 1550 - Tea Break
12. 1550 – 1630 - Sensor technologies
13. 1640 – 1720 - Certifications in lube oil analysis

## FACILITATOR



**Zainudin Yahya; BEng. (Electronics & Mathematics) Joint Honours from University of Nottingham  
Managing Director of CbM Solutions Sdn. Bhd.**

Mr. Zainudin Yahya was conferred a Bachelor's Degree in Engineering from Nottingham University, United Kingdom in June 1996.

He started his career in December 1996 as a Project Engineer at Petrosains & Concert Hall, at the heart of the PETRONAS Twin Towers. The project centered around developing interactive and entertaining exhibits related to the petroleum related science however, his proudest moment was to have lead the installation and commissioning of world-renowned Klais' pipe organ at the Concert Hall's internal façade.

In total he has dedicated 10 years of his career with PETRONAS helming six different positions. He made a switched early in his career into marketing, joining the pioneer batch of "Market Seeding Program". Upon the completion of the program, he was appointed as Business Analyst for Commercial & Retail Sales Group primarily involved in the development of long-term strategy and plans for PETRONAS' downstream marketing. Thereafter, he was sent to the field as Trading Area Manager, managing PETRONAS gas station dealers. Just as he had covered two different trading areas within just over a year, the management brought him back to the engineering field as Lubricant Engineer for PETRONAS Dagangan. Though he was not professionally trained in Mechanical Engineering, the role had forced him to undertake extensive on-the job training, and proactive role in solving lubricant application issues supporting six field engineers. This stint inducted him into the field of Oil Analysis and Condition Monitoring. Again, his tenure was short and he was then transferred to PETRONAS Lubricant Unit, initially to provide technical support to overseas marketing network. The last position held in PETRONAS was as the Head for New Market Entry having involved with due-diligence prior to the take-over of FL Selenia, market entry into India and market entry into Japan.

During his tenure as International Technical Support Engineer, he had the opportunity to work with Kittiwake the leading brand in onsite and online oil analysis. Towards the end of his career in PETRONAS, he was offered to join Kittiwake earlier, however only agreed to join once his "bond" terms was completed in December 2006. Since January 2007, he had served Kittiwake eversince as Regional Manager Asia Pacific. Though still heavily involve with Parker Kittiwake activities within Asia Pacific, he now putting more focus in CbM Solutions Sdn. Bhd. A company specializes in Condition Monitoring Technologies, primarily for Oil Analysis carrying the motto "Detect-to-Protect".

In Condition Monitoring field, he has close to 10 year experience primarily in the field of Oil Analysis. He is a qualified Oil Monitoring Analyst from the Society of Tribology & Lubrication Engineers. He had presented a paper on Inductive Coil Magnetometry for Ferrous Debris Monitoring at 2<sup>nd</sup> International Conference on Advanced Tribology in Singapore. He had also presented on Online Oil Analysis Technology during a conference organized by China's Society of Tribology in Wuhan University, People's Republic of China. More recently he had been appointed as Industrial Advisory Board member for Razak School, University Technology Malaysia for Maintenance Engineering Master's programme.



**Mr. Azhar Abdullah was conferred Bachelor of Engineering (Hons.) in Mechanical Engineering from Universiti Teknologi Malaysia, Skudai, Johor Darul Takzim in July 2002.**

He started his professional career as Technical Sales Engineer for ECONOMOS Malaysia Sdn. Bhd., a full subsidiary of SKF Group from August 2004 to June 2006. His major roles is to provide technical consultation of sealing solutions for various application by using ECONOMOS unique custom machines seals. Proper selection of seal profiles and materials is crucial to ensure reliable sealing process to avoid oil leakage and prevent contamination from entering the system.

He later joined ITS Synergy Plus Sdn. Bhd. (ITSSP) as Sales Engineer to develop new skills in hydraulic system design, troubleshoot, commissioning and upgrade from July 2006 to February 2009. During this period he started to realize the importance of oil cleanliness level to ensure hydraulic systems and other lubrication systems reliability. ITSSP was the pioneer in Malaysia to provide oil purification services in Malaysia by using German based Internormen high quality purification and filtration system as well as on-site oil cleanliness level monitoring by using portable laser blockage Particle Counter. By providing oil purification services, ITSSP customers managed to extend oil change interval to more than one year and at least 40% cost savings compared to changing new oil. A lot of ITSSP customers have benefited more than 70% reduction in machines breakdown and spare parts replacement after achieving and maintaining oil cleanliness level as recommended by OEM.

In March 2009, he joined a company named NanoC Sdn. Bhd., a company which specializing in contract R&D in nanotechnology and catalyst research as Field & Sales Engineer. In 2009, NanoC has set up Oil Condition Monitoring department which provide laboratory analysis for in-service lube oil for various customers in Malaysia, including Oil & Gas sector. His major role is to develop new market for in-service oil analysis, evaluate the test data, provide diagnostic reports and answering any technical related issues with customers. Based on oil analysis report, a remedial action can be suggested and implemented by NanoC Technical Department Team, for example changing new oil and tank cleaning, lube oil flushing, oil purification and filtration. NanoC customers receive total solutions in oil analysis and oil treatment to their lubrication systems.

In March 2011, he joins Kittiwake Asia Pacific Sdn. Bhd. (now CbM Solutions Sdn. Bhd.), an exclusive distributor for Kittiwake product in Malaysia as Senior Engineer/Lubricant Analyst. His role is to develop new market for Kittiwake Lube and Fuel monitoring products for Malaysia market, conduct technical training for customers and on-site oil analysis. One of the main objective is to promote a systematic, well designed oil analysis program for customers to get the reliable results to allow early detection of potential problem (high contamination level, abnormal wear rates, improper lubrication practice, highly degraded oil, incorrect oil) before major failure occurs. He has helped many customers in Malaysia to have a proper oil analysis program starting with development of machines database, best practice of oil sampling, selection of test parameters for each machines, setting up a mini lab for oil analysis and results interpretation. He is a certified Machine Lubricant Analyst Level II (MLA II) since March 2011 and MLA III since December 2012 by International Council for Machinery Lubrication (ICML).



**Dr. M. Kamel Wan Ibrahim Was conferred B.Eng (Hons) (UiTM) in 1999, M.Sc (Leeds) in 2002, PhD (Sheffield) in 2013.**

**Special Advisor of CbM Solutions Sdn. Bhd.**

He started his career as private college teacher for a few months before joining Universiti Malaysia Sabah (UMS) since 2000 as a Tutor. Within two years, he pursued his study at University of Leeds, United Kingdom majoring in Tribology and Surface Engineering. His return to UMS enabled him to enhance teaching and learning skill at School of Engineering and Information Technology under the program of Mechanical Engineering. He has taught numerous engineering courses such as Statics, Fluid Mechanics, Maintenance and Condition Monitoring, Operational Research, Finite Element Method, Mechanical Design and Tribology.

He was appointed as Head of Program of Mechanical Engineering in 2004 to run a degree program for Mechanical Engineering. During his 4 years tenure, he managed to restructure the degree program according to Outcome Based Education (Washington Accord) by introducing new subject and refreshing syllabi. He is much involved in training and development for several companies such as Nexus Karambunai Resort, PETRONAS Methanol and Kementerian Pendidikan F1 School CAD Training.

In 2008, he continued his study as PhD candidate at Leonardo Centre of Tribology, University of Sheffield focusing on ball bearing lubrication and monitoring. The work aims here is to develop new experimental techniques which combined film thickness and contact measurement for rolling bearing performance study. The work demonstrates the manipulation of single pulse waveform behaviour which can be extracted into lubricant film thickness measurement, contact size measurement and surface displacement measurement. He completed his research in 4 years and 3 months and awarded Doctorate in June 2013. He now holds a senior lecturer post at the School of Engineering and Information Technology.

## ADMISSION

Venue: Grand Borneo Hotel, 1Borneo Hypermall, Jalan UMS, 88450 Kota Kinabalu, Sabah

Date: 19<sup>th</sup> to 22<sup>nd</sup> August 2014

Course Fees: **RM1,750/pax for payment before 30<sup>th</sup> June 2014 and RM2,000 before closing.**

Closing Date: 31<sup>st</sup> July 2014

**All fees MUST be fully paid** before commencement of the course otherwise participants will not be allowed to enter the lecture theatre. Reservations/bookings by fax or email of intending participants are acceptable with payment being forwarded before the closing date.

Cheque payable to: **CbM Solutions Sdn. Bhd.**

Bank Name: **MALAYAN BANKING BERHAD**; Account no: **564052109683**; Swift Code: **MBBEMYKL**

The fee paid is non-refundable. However substitution of participant(s) will be permitted with prior notification. In view of the limited places available, intending participants are advised to sent their registration as early as posible. CbM Solutions Sdn Bhd reserves the right to alter or change the programme due to unforeseen circumstances.

Fees include course materials, meals and beverages only throughout the duration of the program.

### CONNECT WITH US

For more information, please contact our client service:

<p><b>Dr. M. Kamel Wan Ibrahim</b></p> <p><b>CbM Solutions Sdn. Bhd.</b></p> <p>E-8-6 Block E, Megan Avenue 1, 189 Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia</p> <p><b>Web:</b> <a href="http://www.cbmsolutions.com.my">www.cbmsolutions.com.my</a></p>	<p><b>Tel :</b> +60 (0) 19 5355571 <b>Fax:</b> + 60 (0) 3 2333 8899</p> <p><b>Email:</b> <a href="mailto:kamelwi@cbmsolutions.com.my">kamelwi@cbmsolutions.com.my</a></p>
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