

RELIABILITY THROUGH LUBRICATION

**Keeping the wheels
of industry turning.**





Reliability Through Lubrication

**A complete range of services aimed
at supporting your lubrication
management initiatives:**

- ✓ **Audits and consulting**
- ✓ **Best practices training**
- ✓ **Lubricant consolidation**
- ✓ **Lubricant colour coding**
- ✓ **Technical support**
- ✓ **Software scheduling**
- ✓ **Procedures development**
- ✓ **Strategy guidance**



www.kewengineering.co.uk

KEW Engineering

Helping industry achieve success through world class lubrication activity since 2005.

We can help your business succeed.

What we offer?

A complete range of services aimed at improving your lubrication management on site:

- . Consulting**
- . Training**
- . Support**
- . Audits**
- . Surveys**
- . Software**

Our services are backed by years of experience working in maintenance, technical support and

The background of the slide is an abstract, artistic representation of a blue liquid splash or water droplets. The liquid is depicted with various shades of blue, from light to dark, creating a sense of movement and fluidity. The splash originates from the top right and flows downwards and outwards, with many smaller droplets and bubbles scattered throughout the scene. The overall effect is clean, modern, and dynamic.

The benefits of working with KEW Engineering:

A flexible partnering approach for maintenance engineers offering a range of services focused on:

- . Best Practice**
- . ISO 55000 compliance**
- . Consistent PM activity**
- . Safer tasks**
- . Cleaner & greener activity**
- . More efficient scheduling**
- . More effective planning**
- . More efficient manpower utilisation**
- . Offering independent advice**
- . A dedicated and experienced consultant**

What do we offer?

- **Training to an accreditation level, both onsite and offsite in:**
 - **Lubrication theory**
 - **Contamination control**
 - **Oil analysis**
- **Consulting work:**
 - **We can audit your plant to establish a Return On Investment for lubrication improvements.**
 - **We can create your ideal lubrication strategy document.**
 - **We can consolidate your lubricant list and support selection of both lubricants and lubricant suppliers.**
 - **We can advise on design of your lubrication management needs including oil store design**
 - **We can visit your plant to compile a library of tasks, inspections and improvements procedures.**
 - **We can offer ongoing support in all aspects of lubrication**

Why use KEW Engineering Ltd?

We can do it in a very short time frame.

We are also:

- **independent,**
- **commercially unbiased,**
- **many years of experience,**
- **broad industry knowledge,**
- **focused on your goals,**
- **flexible to your needs,**
- **value driven,**
- **delivering a quality service on time.**

About KEW Engineering...

KEW Engineering was set up in 2005 with the aim of bringing a pragmatic and hands on approach to training and consultancy in the field of lubrication, oil analysis and contamination control.



The story behind KEW Engineering

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 in the UK and provided technical support on their contamination monitoring instruments to clients in a variety of industries.

Martin 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 20 years, he has been presenting training classes and undertaking consulting projects on an international level, initially on behalf of Noria Corp and later, as KEW Engineering, working with key clients such as BP, Dow Corning, Marathon Oil, Repsol Sinopec, Aughinish Alumina, Sonae Arauco and Cargill.

Martin attained his CMRP (Certified Maintenance & Reliability Professional) status with SMRP (Society for Maintenance & Reliability Professionals) in 2005. Since its inception Martin has been involved with ICML (International Council for Machinery Lubrication), as well as working on various related ISO working groups.

Martin has experience working in pulp & paper, particle board manufacturing, aluminium smelting and processing, open pit and underground mining and ore processing, pharmaceuticals, food & beverage, offshore oil & gas, petro-chemicals and steel making. Martin maintains his offshore safety and survival certification.

The name of the company was chosen as a way to remember Martin's late father, Keith Williamson, himself an engineer and expert in contamination control and filtration, who inspired and mentored many an apprentice and young engineer.



Machinery Lubrication and Oil Analysis Training

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

Our certification courses to help you:

- ☑ understand the fundamentals of lubrication and oil analysis
- ☑ get more out of your lubrication strategy
- ☑ improve your oil analysis 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.

Who Should Attend?

- ☑ Plant Managers
- ☑ Operations Managers
- ☑ 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!

On-site or off-site?

Whether your needs are simply short awareness sessions or certification training, KEW Engineering are able to offer a flexible package to suit your needs, both at your site or at our public venues.

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, Indonesia and Malaysia. We have trained in over 40 countries, with a reputation for delivering excellence and success in the Middle East and the Far East.

Mastering Lubrication Technology

Level 1 - Course Outline

Maintenance Strategies

- Why machines fail
- The impact of poor maintenance on company profits
- The role of effective lubrication in failure avoidance
- Lube routes and scheduling
- Oil analysis and technologies to assure lubrication effectiveness.
- Equipment tagging and identification.

Lubrication Theory/Fundamentals

- Fundamentals of tribology
- Functions of a lubricant
- Hydrodynamic lubrication (sliding friction)
- Elasto-hydrodynamic lubrication (rolling friction)
- Mixed-film lubrication
- Base-oils
- Additives and their functions
- Oil lubricant physical, chemical and performance properties and classifications.
- Grease lubrication
 - How grease is made
 - Thickener types
 - Thickener compatibility
 - Grease lubricant physical, chemical and performance properties and classifications.

Lubricant Selection

- Viscosity selection
- Base-oil type selection
- Additive system selection
- Machine specific lubricant requirements
 - Hydraulic systems
 - Rolling element bearings
 - Journal bearings
 - Reciprocating engines
 - Gearing and gearboxes
- Application and environment related adjustments.

Lubricant Application

- Basic calculations for determining required lubricant volume.
- Basic calculations to determine re-lube and change frequencies.
- When to select oil; when to select grease.
- Effective use of manual delivery techniques.
- Automatic delivery systems.
 - Automated deliver options.
 - Automated grease systems
 - Oil mist systems
 - Drip and wick lubricators
 - Deciding when to employ automated lubricators.
 - Maintenance of automated lubrication systems.

Lube Storage and Management

- Lubricant receiving procedures.
- Proper storage and inventory management.
- Lube storage containers
- Proper storage of grease-guns and other lube application devices.
- Maintenance of automatic grease systems.
- Health and safety assurance.

Lube Condition Control

- Filtration and separation technologies.
- Filter rating.
- Filtration system design and filter selection.

Oil Sampling

- Objectives for lube oil sampling
- Sampling methods
- Managing interference
 - Bottle cleanliness and management
 - Flushing
 - Machine conditions appropriate for sampling

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
 - 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
- Fluid properties test methods and measurement units - applications and limitations.
- Kinematic Viscosity (ASTM D445)
 - Absolute (Dynamic) Viscosity (ASTM D2893)
 - 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

Wear Debris Monitoring and Analysis

- Common machine wear mechanisms

A three-day class which allows for students to take the MLAI/MLTI three-hour examination on the fourth day.

Mastering Lubricant Analysis

Level 2 - Course Outline

Lubricant roles and functions

- ◆ Base oil
 - ◆ Functions
 - ◆ Properties
- ◆ Additive functions
 - ◆ Surface active additives and their functions
 - ◆ Bulk oil active additives and their functions
- ◆ Synthetic lubricants
 - ◆ Synthetic lubricant types
 - ◆ Conditions dictating their use
- ◆ Lubrication regimes
 - ◆ Hydrodynamic
 - ◆ Elasto-hydrodynamic
 - ◆ Boundary

Oil Analysis Maintenance Strategies

- ◆ Fundamental aspects of Reliability-Centered Maintenance (RCM)
- ◆ Fundamental aspects of Condition-Based Maintenance (CBM)
 - ◆ Predictive maintenance strategies
 - ◆ Proactive maintenance strategies

Oil Sampling

- ◆ Objectives for lube oil sampling
- ◆ Equipment specific sampling:
 - ◆ Gearboxes with circulating systems
 - ◆ Engines
 - ◆ Single and multi-component circulating oil systems with separate reservoirs
 - ◆ Hydraulic systems
 - ◆ Splash, ring and collar lubricated systems
- ◆ Sampling methods
 - ◆ Non-pressurized systems
 - ◆ Pressurized systems - Low
 - ◆ Pressurized systems - High
- ◆ Managing interference
 - ◆ Bottle cleanliness and management
 - ◆ Flushing
 - ◆ Machine conditions appropriate for sampling
- ◆ Sampling process management
 - ◆ Sampling frequency
 - ◆ Sampling procedures
 - ◆ Sample processing

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
 - ◆ Additive depletion/degradation
 - ◆ Additive depletion mechanisms
 - ◆ Additives at risk for depletion/degradation by the various mechanisms.
- ◆ Testing for wrong or mixed lubricants
 - ◆ Baseline physical and chemical properties tests
 - ◆ Additive discrepancies
- ◆ 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

Lubricant contamination measurement and 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
- ◆ Glycol coolant contamination
 - ◆ Effects on the machine
 - ◆ Effects on the lubricant
 - ◆ Methods and units for measuring glycol contamination
 - ◆ Techniques for controlling glycol contamination
- ◆ 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
- ◆ 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

Wear Debris Monitoring and Analysis

- ◆ Common wear mechanisms
 - ◆ Abrasive wear
 - ◆ Two-body
 - ◆ Three-body
 - ◆ Surface fatigue (contact fatigue)
 - ◆ Two-body
 - ◆ Three-body
 - ◆ Adhesive wear
 - ◆ Corrosive wear
 - ◆ Cavitation wear
- ◆ Detecting abnormal wear
 - ◆ Atomic emission spectroscopy methods
 - ◆ Inductively coupled plasma (ICP) spectroscopy
 - ◆ Arc-spark emission spectroscopy
 - ◆ Wear particle density measurement
- ◆ Wear debris analysis
 - ◆ Ferrogram preparation
 - ◆ Filtergram preparation
 - ◆ Light effects
 - ◆ Magnetism effects
 - ◆ Heat treatment
 - ◆ Basic morphological analysis

A three-day class which allows for students to take the MLAI three-hour examination on the fourth day.

Advanced Mastering Lubricant Analysis Level 3 - Course Outline

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

A three-day class which allows for students to take the MLAIII three-hour examination on the fourth day.



What past attendees have to say:

"An excellent, informative presentation. Very well explained, with easy to follow manual. Invaluable for our new mission!"

Ray Young, Reliability Technician, Petrofac.

"Very enjoyable course, found content to be very relevant & instructor very knowledgeable on course content."

Russell Parry, Reliability Eng., AV Technology

"The course was 1st class & highlighted how far we have to go before achieving a good quality lubrication programme."

Colin Sample, Reliability Supervisor, Marathon Oil

"Small details are important. I used to neglect this. Not anymore!"

Wong Ik Yeang, Operator, Sarawak Energy

"Very informative & enlightening course. Well presented and well experienced presenter."

Noel P. Macatangay, Mech. Eng., ADGAS

"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.

Get Qualified by the International Council for Machinery Lubrication

KEW Engineering Ltd. have been supporting the International Council for Machinery Lubrication since its inception and are proud to be associated with their efforts to drive the success of lubrication in industry.



Why not 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*.

KEW Engineering currently offer courses that cover the body of knowledge for:

- ☑ Level I Machinery Lubrication Technician
- ☑ Level I Machine Lubricant Analyst (ISO 18436-4, I)
- ☑ Level II Machine Lubricant Analyst (ISO 18436-4, II)
- ☑ Level III Machine Lubricant Analyst (ISO 18436-4, III)

Why a Lubrication Audit of your facility?

- An audit will help identify where you can make improvements in your lubrication strategy.**
- A cost benefit analysis of your current performance will help establish a Return on Investment value to help justify the improvements you want to make.**

According to BP, lubricants account for less than 1% of the maintenance budget.

Yet, lubrication can impact more than 40% of the maintenance budget.

Lubricants can influence performance in:

- Energy consumption**
- Health & Safety**
- Environmental performance**
- Productivity**
- Reliability**
- Profitability**

How does the audit work?

We assess your current lubrication practices in a number of key areas:

- **Purchasing**
- **Storage, handling and dispensing**
- **Personnel & staff awareness**
- **Contamination control**
- **Oil analysis**
- **Machinery set-up**

Each category has a number of issues we review and we then apply a ranking or score to establish a final report that helps us to prioritise the areas for improvement.

What is the deliverable?

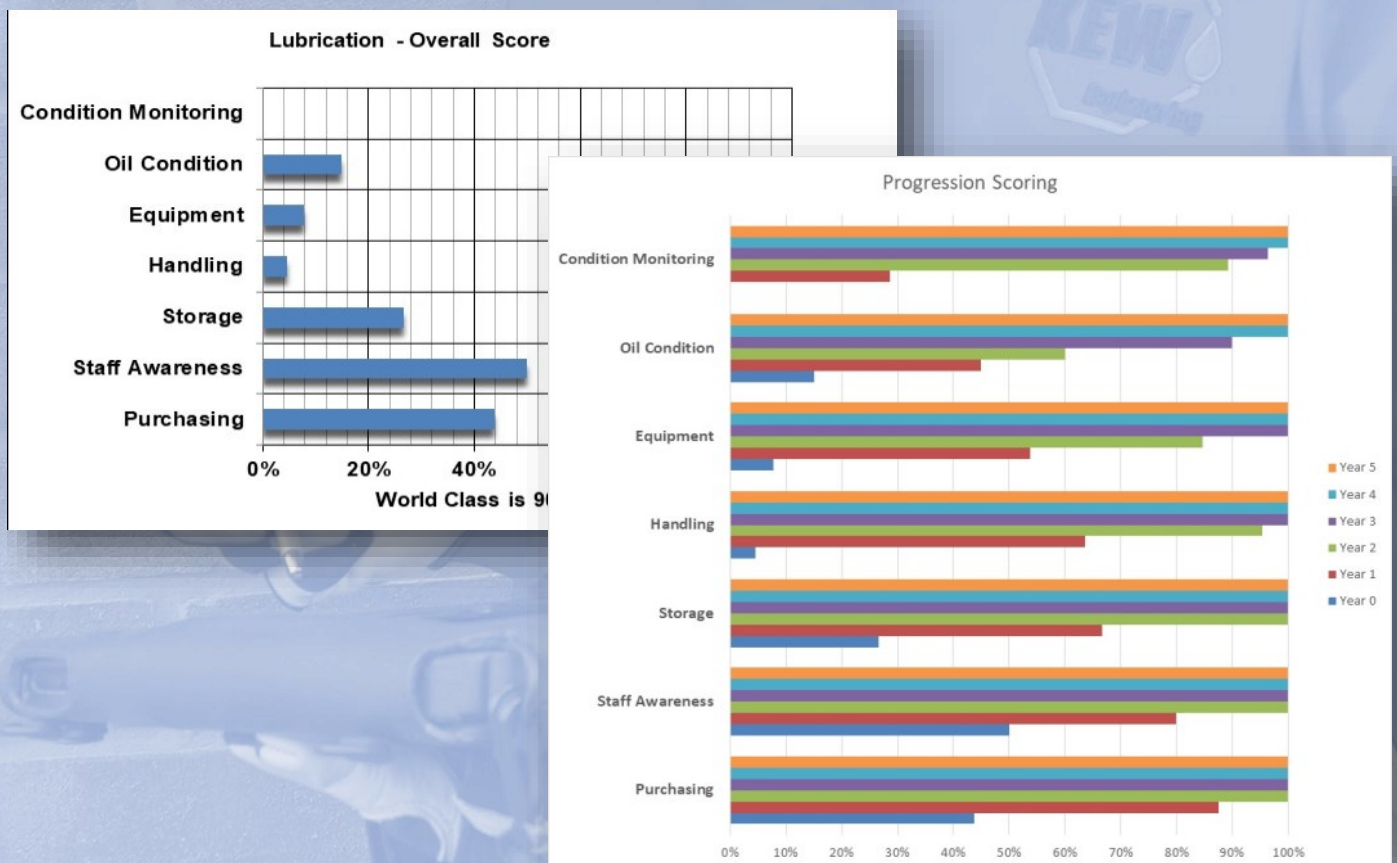
The audit deliverable is a report that details:

- Your site's ranking relative to World Class standards
- A detailed breakdown of the issues found within each category reviewed
- A list of immediately correctable issues that could potentially save money in the short term
- Guidance on what Best Practice is within each category
- A 5-year cost benefit analysis based on current expenditure with a Return on Investment calculated against the expected expenditure for the improvements
- A proposed strategy for implementing improvement to bring the site to a World Class standard

In addition, we provide a two hour short training session for all interested parties identifying the need for best practice lubrication. This helps to establish the need for best practice and clarify the scoring process.

An audit will highlight areas of weakness and provide a starting point on the Improvement Roadmap leading to:

- **A structured improvement plan**
 - **Best Practice implementation**
 - **Consistent PM activity**
 - **Safer work methods**
 - **Cleaner & Greener activities**
 - **More efficient lubrication**
 - **More effective lubrication**
 - **Use of less resources**
 - **Continuous improvement in future**
- Lubrication Efficiency Scores**



KEWbic™ -

the complete, flexible lubrication scheduling and management tool designed for complete lubrication management.



What is KEWbic™?

A complete, adaptable maintenance management system that allows you to:

- Store information on your lubricants
- Store information on your machinery
- Manage procedures for each asset
- Manage the lubrication equipment
- Schedule work orders
- Record activities as completed
- Trend oil top-up usage
- Check lubricant stock inventories
- Manage lubrication consumables
- Schedule oil sampling
- Store oil analysis data
- Trend oil analysis results

KEWbic™ can work as a flexible, stand-alone package for small users, or simply form the basis for creating the procedures to use in your ERP/CMMS systems.

What are the benefits of KEWbic™?

A flexible package created for maintenance engineers by maintenance engineers.

KEWbic™ - Procedures and Scheduling that result in:

- Best Practice
- ISO 55000 compliance
- Consistent PM activity
- Safer tasks
- Cleaner & greener activity
- More efficient scheduling
- More effective planning
- Reduced manpower needs
- Easy labelling of assets

Flexible thinking. By using Microsoft® SQL Compact Edition, we've kept the costs down and we've made the package simple to install and use. Or if you need more control and networking, KEWbic™ is also available on Microsoft® SQL Server.

Flexible thinking. Each asset can have it's own label with the exact quantity of lubricant along with a visual colour code and asset tag produced with just one click of the mouse from within KEWbic™.

How does it work?

- We can audit your plant to establish a ROI for lubrication improvements (optional).
 - We then visit your plant to record the required information.
 - The information is compiled within KEWbic™.
 - The final package is delivered to site along with training on the new procedures.
- Or you can do this all yourself with our support.

How do we build your system?

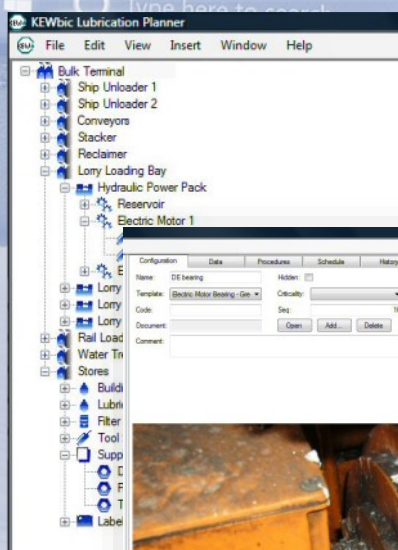
- We build a virtual storeroom
 - We create a hierarchy of assets by area
 - We split the asset train into individual machines
 - We split the machine into its lubricated parts
 - We select the lubrication PM tasks required
 - We decide on the machine modifications required
 - We define the oil analysis procedures, if needed
 - We set up the scheduling for the lubrication PMs
 - We set up the reporting functions
- Or you can do this all yourself with our support.

Why use KEW Engineering Ltd?

We can do it in a very short time frame. We are also:

- independent,
- commercially unbiased,
- many years of experience,
- broad industry knowledge,
- focussed on your goals,
- flexible to your needs,
- value driven,
- delivering a quality service on time.

At KEW Engineering, we pride ourselves on our Health & Safety and Environmental focus. We can help you.



aegex
TECHNOLOGIES

Setting up the Lubricant Store.

- We create a list of oils, greases, filters and breathers, as well as tools like the grease guns and the filter carts
- We identify the specifications of each item along with the supplier details
- We assign a generic code and colour/code symbol for each lubricant
- We attach any relevant electronic literature such as the MSDS and PDS

Flexible thinking. If you change the supplier of your grease guns, the number of shots of grease may not be right. So just go to the tool store and enter the new quantity of grease your gun outputs, and all your procedures will automatically be corrected with the new number of shots required.

What's included in a procedure?

- Scope or purpose
 - Materials list
 - Tools list
 - Safety issues
 - Preparation checklist
 - Actual task with bulleted steps
 - Annotated pictures and diagrams
- Plus, to make the scheduling more flexible and efficient, we include with each task the:
- Time to complete
 - Manpower needs including a skill level
- We allow for a sign-off for each time the procedure is used, or to enter a reason for non-completion.

Flexible thinking. The Machine and Procedure templates can be customised. KEWbic™ can be tailored to suit not only the text you need in the procedures, but can also be set up in any language of your choice.

The screenshot shows the KEWbic software interface. On the left, there is a tree view of lubricants under 'Lubricant Store'. The main window displays a detailed view of a 'TOTAL' lubricant, 'Very high performance lubricant for diesel engines'. It includes sections for 'UTILISATION' (All industrial vehicles, All types of services, Environment) and 'PERFORMANCES' (Specifications: ACEA, API, GLOBAL DHD-1; OEMs approvals: MERCEDES, MAN). A large blue logo is overlaid on the right side of the screenshot.

	BP ANGOLA Greater Plutonio & PSVM Lubrication Procedures											
Electric Motor Greasing - without Purge Lubrication Compartment: MOTOR BEARINGS Machine Name - PM-85402A - HYDROCHLORITE PUMP Manufacturer: SIEMENS Model number: 1LA6 163-2AA96-Z Location: TOPSIDES - M124 - WATER INJECTION UPPER This procedure is applied every 56 days. This unit uses Castrol High Temperature Grease - (Yellow Square coded) grease. Apply 19 shots (29.2gm) in the DE. Apply 14 shots (20.6gm) in the NDE.												
Asset Image												
All Safety rules must be obeyed. Caution - Equipment will be operating - follow all safety procedures for this activity. If required by company safety policies, lock-out the motor before greasing. Wear appropriate Regulation PPE. WARNING - Lubricant can be a safety and health hazard - read the MSDS. Take care if removing the grease fitting as there may be pressure inside the housing.												
A grease gun filled with Castrol High Temperature Grease												
Questions <table border="1"> <tr> <td>Was there any contamination noted?</td> <td>N/A</td> </tr> <tr> <td>Was any wear debris material?</td> <td>Unit not available</td> </tr> <tr> <td>Was the drained oil very dark?</td> <td>Unit currently being repaired</td> </tr> <tr> <td>Was the oil level low prior to d...</td> <td>Other</td> </tr> <tr> <td>Quantity of [OIL] used in L</td> <td></td> </tr> </table> OK Cancel			Was there any contamination noted?	N/A	Was any wear debris material?	Unit not available	Was the drained oil very dark?	Unit currently being repaired	Was the oil level low prior to d...	Other	Quantity of [OIL] used in L	
Was there any contamination noted?	N/A											
Was any wear debris material?	Unit not available											
Was the drained oil very dark?	Unit currently being repaired											
Was the oil level low prior to d...	Other											
Quantity of [OIL] used in L												

Scheduling in KEWbic™

In the "Schedule" tab, your Planner or Lubrication Technician can see the tasks awaiting action at the start of the day.

Or, by changing the settings to a larger time interval, planning and sorting of tasks can be carried out in advance, useful if you have a planned shut down due.

Overdue tasks will be shown in red.

Multiple activities can be signed off in just a few mouse clicks. Or where required, tasks can be signed off individually, allowing input of

feedback to facilitate trending of the asset history at a later stage.

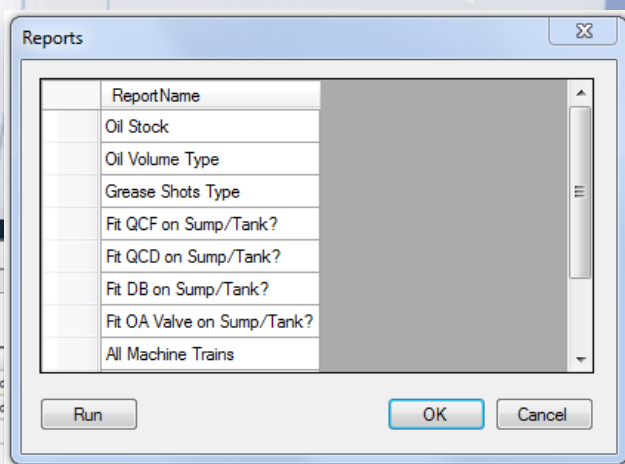
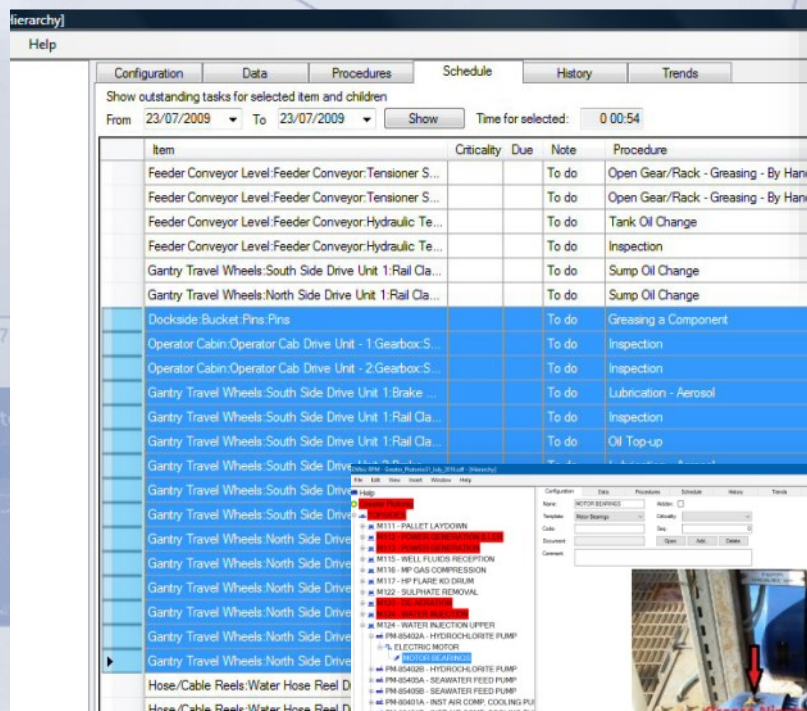
Flexible thinking. By including a skill level and a time to complete, the scheduling can be sorted according to the manpower available, or by the task type, or simply by area. By selecting a set of tasks, a total time to complete is automatically calculated.

Reporting in KEWbic™

Any report can be set-up. Whether it be a report of all the sump volumes and the oil type you need, or whether it be a stock level check, KEWbic™ can provide the answers. Want to know which machines use a desiccant breather? Just set up and run the report.

Flexible thinking. Because the KEWbic™ platform is Microsoft® based simply grab the data and dump it into Word or Excel for tailored management reporting.

It doesn't get any easier when it comes to managing your lubrication.



Recording in KEWbic™

Every procedure allows for a sign off. Each sign off can be set according to the procedure and include alarms and limits to flag up issues. With a graphical function, too, oil analysis data can also be handled.

Flexible thinking. Unique alarms for each asset can be set for whatever need; top ups, oil analysis data, stock checks, etc.

Help

Greater Plutonio

TOPSIDES

- M111 - PALLET LAYDOWN
- M112 - POWER GENERATION & LER
- M113 - POWER GENERATION
- M115 - WELL FLUIDS RECEPTION
- M116 - MP GAS COMPRESSION
- M117 - HP FLARE KO DRUM
- M122 - SULPHATE REMOVAL
- M123 - DE-AERATION
- M124 - WATER INJECTION
- M124 - WATER INJECTION UPPER
- M125 - LP-SEPARATOR
- M126 - LP COMPRESSION
- M126 - METHANOL
- M127 - HP GAS COMPRESSION
- FORWARD MACHINERY SPACE
- AFT MACHINERY SPACE
- Stores
- Information

Record Procedure Execution

Item name: Ship Unloader 2

Procedure: Sump Oil Change

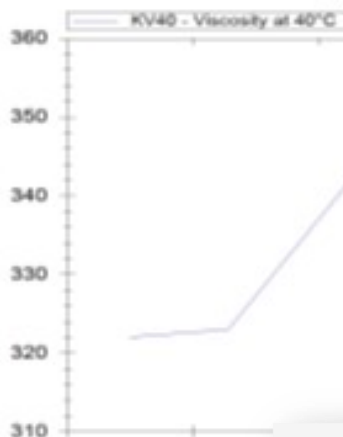
Date: 23/07/2009

Question	Observation
Was this procedure completed?	Yes
Reason for non-completion:	
Was any contamination noted?	N/A
Was any wear debris material ...	Unit not available
Was the drained oil very dark?	Unit currently being repaired
Was the oil level low prior to d...	Other
Quantity of [OIL] used in L	

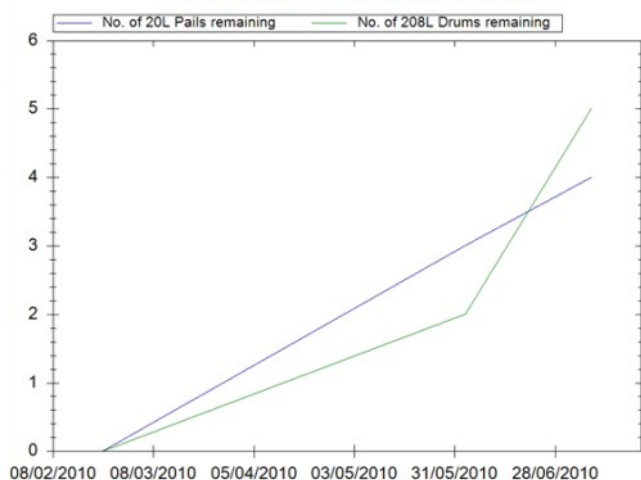
OK

Cancel

Sump - OA-Gearbox



Tection Global 15W40 - Oil Stock Check



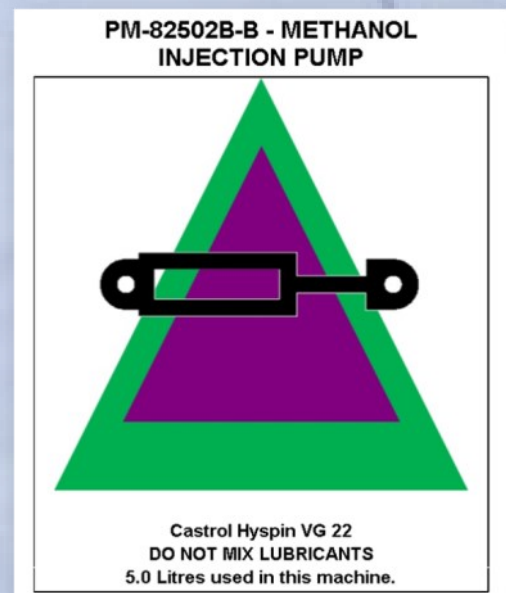
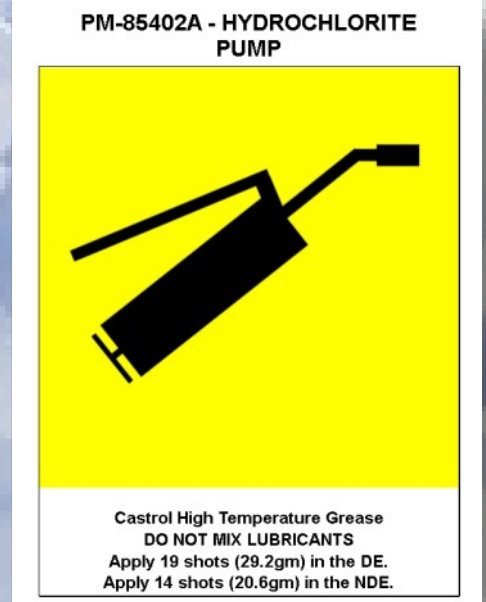
Configuration Data Procedures Schedule History Trends

Procedure	Due	Preview	
Sump Oil Cha...	On condition	☒	Record...
OA-Gearbox	17/08/2008	☐	Record...

Useful functions in KEWbic™

Flexible thinking. Each asset can have it's own label with the exact quantity of lubricant along with a visual colour code and asset tag produced with just one click of the mouse from within KEWbic™.

Flexible thinking. Print off labels easily and quickly for each lubricant for the products in storage.



KEWbic™ - In the office or in the field

With the supplied dock, connect to a screen, keyboard and mouse, and printer in the office, then pick it up and use on site. Always connected.

- Windows 10
- ATEX Zone 1
- Wi-Fi and SIM
- Touch screen
- Rugged case and stylus

The tablet can be supplied as part of the software.



**It doesn't get any easier when it comes to
managing your lubrication.**

Please call to discuss your needs:



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Consultancy Firm & Best Electronic
Maintenance Management
System: KEWbic®CMMS

A blue-tinted photograph of three classic Jaguar cars racing on a track. The cars are in a line, moving away from the viewer. The car in the foreground is a Jaguar XK150, with the number '53' on its hood and the license plate '150HTB'. The car in the middle is a Jaguar XK140, and the car in the background is a Jaguar XK120. The track is a paved road with a white line on the right side. The background shows a grassy area and a fence.

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programme on
track.**

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