

A blue-tinted photograph of two industrial workers in a refinery. They are wearing hard hats, safety glasses, and earplugs. One worker is holding a long, thin metal rod. The background is filled with a complex network of large pipes and industrial equipment.

WHY TRAIN FOR MACHINERY LUBRICATION?



DES-CASE®

INTRODUCTION

In the world of maintenance and reliability, and machinery lubrication in particular, it is uncommon to see a program or organization where everything is done perfectly. It's also uncommon to find a program that has everything wrong. Most organizations do a good job in some areas, but are weak in others.

There are many components to a world-class lubrication program – contamination control, oil analysis, PM optimization, lubricant selection and education, just to name a few. Of all of these, the one piece that affects every aspect of the program is education. Without proper knowledge of lubrication theory, application techniques, oil sampling methods, etc, it is very difficult to be successful in all areas.

Concepts such as filtering new oil before use or using dedicated containers for different types of lubricants may seem to some like a waste of time and money. Even when these best practices become company policy, when individuals don't understand or agree with the value of certain procedures or tasks, they may choose to cut corners or disregard best practices altogether. To ensure the greatest measure of success, it is essential that all individuals involved with the maintenance or operation of lubricated equipment be educated to some extent on the theory and practice of world-class lubrication techniques. Adopting training standards that outline the minimum education requirements for each job function affecting lubrication as well as identifying or creating skills assessment standards will ensure minimum competence levels for each role. Like most improvement initiatives, education is an investment. In today's climate, training budgets are certainly at risk and it is important to carefully consider the economic impact of training. According to a study performed by the ASTD (American Society for Training and Development), companies that spent on average \$275 per employee per year on training, earned annual gross revenue of \$121k per employee. Companies investing \$900 per employee earned \$168k per employee. Spending an additional \$625 per employee resulted in 38% more revenue per employee or an additional \$47k. This represents a good investment in any economy.

TRAINING STANDARDS

The key to a successful training program is to define the proper training and certification or knowledge assessment level for each job function. All or part of the training curriculum can be developed and administered in house, or from a number of reputable organizations that offer lubrication and oil analysis training courses ranging from short introductory courses to advanced levels. Many of the available multi-day courses are structured in accordance with the ICML (International Council for Machinery Lubrication, www.lubecouncil.org) bodies of knowledge for MLT (Machinery Lubrication Technician) and MLA (Machine Lubricant Analyst).

As the appropriate courses are identified for each job function, it is important to note that lubrication technicians and mechanics are not the only functions that affect the quality of lubrication and reliability of lubricated machinery. Operators, Managers and the Engineers that design equipment also play an important role in the success of a world-class lubrication program. Table 1.1 below is an example of appropriate lubrication courses for different job functions.

Job Function	Introductory Course 1/2 - 1 Day	MLT I 3-Day Machinery Lubrication	3-Day Oil Analysis
Mechanics	R	R	O
Lube Techs	R	R	R
PdM Techs	R	O	R
Reliability Engineers	R	R	R
Maintenance Mgr/Supervisors	R	O	O
Operators	R	O	N/A
Operators Mgr	R	N/A	N/A
Engineering Mgr	R	O	N/A

Table 1.1 R = Required O = Optional N/A = Not Applicable

WHO SHOULD BE TRAINED?

MECHANICS

In some organizations, all lubrication activities are performed by mechanics. In others, dedicated lube techs perform machinery lubrication tasks, while mechanics perform other functions such as installation, rebuilds, etc. Even if mechanics do not perform lubrication tasks, they still play a large role in the lubrication program. World-class programs require related tasks - such as parts storage, new equipment commissioning, precision installation, and equipment modifications - to be done correctly to facilitate lubrication best practices. Equipment modifications (installing sight glasses, sample ports, proper breathers, etc.) require that the mechanics have a good understanding of all lubrication issues. In order to ensure an understanding throughout the organization, it is recommended all mechanics complete a typical 3-day machinery lubrication course.

LUBRICATION TECHNICIANS

It almost goes without saying that the technicians responsible for lubricating machines should have a high level of education in this area. Even if lubrication tasks and procedures are rigorously documented and accounted for, there is still no assurance of quality with respect to following the procedures. To ensure that activities are performed to the desired standard, technicians must understand why they are supposed to perform task in a certain way. When individuals understand and believe in the value of something, they are much more likely to do what's needed to be done.

PDM TECHNICIANS

Many organizations utilize dedicated PdM techs to perform condition monitoring functions such as vibration, thermography, etc. It is often recommended that oil analysis be assigned to this group rather than with lubrication tasks. Whether or not this is the case, PdM technicians should still receive education in lubrication and oil analysis so that they can understand the relationship between oil analysis and other condition monitoring technologies. When these tools are integrated, they become much more powerful than the separate parts. PdM Technicians should receive rigorous oil analysis training and at least an introduction to lubrication in general.

RELIABILITY ENGINEERS

Reliability Engineers should be well educated in both oil analysis and machinery lubrication. Lubrication and oil analysis is a major component of proactive maintenance and should be included in the engineers training curriculum.

MAINTENANCE MANAGERS / SUPERVISORS

It is often surprising, but quite common for Maintenance Managers or supervisors to send their employees to lubrication training courses, but don't attend themselves. This is not a recipe for success. At the very least, managers should attend and introductory course or "awareness training" so that they can understand the good ideas their technicians propose to improve lubrication and reliability. In many of these cases, technicians and mechanics become discouraged by a lack of management support. A world-class program requires support from all levels.

OPERATIONS / ENGINEERING MANAGEMENT

All too often operations, engineering and maintenance are put at odds with one another by competing goals. Engineers often design machines for the cost or value or performance reasons, without as much regard for the maintainability of the equipment. Operations sometimes run machines into the ground to meet production goals, creating nightmares for maintenance. It is essential for everyone understand that their overall goals truly aligned. Everyone wants to be the low cost producer, but sometimes we become short sighted. Reliability is a team effort that requires dedication from the entire organization. Educating operations and engineering on the benefits of designing, operating and maintaining equipment with considerations for lubrication quality is the needed to achieve a world-class program. Introductory level training should be encouraged for these job functions to get support across the board.

SKILLS ASSESSMENT STANDARDS

The greater the number of individuals associated with a lubrication program, the more difficult it is to assure competence. For this reason, it is important to create or adopt skills assessment standards to ensure that everyone who is lubricating machines is qualified to do so. A number of organizations have achieved success in this area by using certifying organization such as ICML or STLE (Society of Tribologists and Lubrication Engineers) or by developing their own skills assessment tests. The ICML was formed to provide certifications for practitioners of lubrication. Most organizations that have achieved world-class programs rely heavily on ICML certification to ensure the highest level of knowledge and skill when it comes to executing precision lubrication. ICML offers multiple levels of certification for Machinery Lubrication Technicians and Machine Lubricant Analysts. It is recommended that the proper certifications be required of all individuals directly involved in lubrication. Table 1.2 provides an example of such a program.

Job Function	MLT I	MLT II	MLA I	MLA II
Mechanics	R	O	O/R	N/A
Lube Techs	R	O	R	O
PdM Techs	O	O	R	O
Reliability Engineers	R	R	R	O
Maintenance Mgr/Supervisors	O	O	O	O
Operators	O	N/A	N/A	N/A

Table 1.2 R = Required O = Optional N/A = Not Applicable

CONCLUSION

Whether beginning a lubrication improvement initiative, or just continuing to improve the existing program, all manufacturing organizations benefit from training and education. Knowledge is not only a prerequisite for engineering a world-class program it is an essential part of executing and maintaining it. Successful maintenance organizations don't just have good people or good processes, they have both.

