



# THE COST REDUCTION GAME

HOW LUBRICATION CAN PLAY A ROLE IN YOUR TCO PROGRAM

**Shell Lubricants**



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Greg Saffell doesn't wear a fedora or a trench coat on the job, but he spends a lot of time doing detective work. As a technical adviser for Shell Lubricants, Saffell has learned to listen carefully the first time he walks through a customer's plant and to ask a lot of questions. From aerospace to marine, from agriculture to mining, companies across a diverse range of industries often understand the need for proper equipment lubrication, but they may be overlooking issues that could impede greater reliability.

These are the issues that Saffell identifies in an effort to develop a total cost of ownership (TCO) program that can help increase equipment reliability.

By definition, maintenance is designed to avoid problems. While most companies understand the importance of good maintenance programs, the challenge can be taking a good program and making it better. By adopting a TCO program, companies can find efficiencies they didn't even know existed, and reap benefits they didn't even realize were possible.

"Typically, customers are having issues that they've come to accept," Saffell says. "They might say 'We just have to change this pump every few months.' They don't realize maybe they can do something to make that pump last longer."

While simple fixes may cost a few thousand dollars, lost revenue from equipment failures can run into the millions of dollars in lost productivity and replacement costs. There can be longer-term impacts, too, if the downtime inhibits a manufacturer's ability to meet customer needs.

That's why it is important for companies to think about lubrication and equipment maintenance holistically, recognizing that short-term cost savings may be leading to bigger, preventable expenses over the long term.

Cheaper oil, for example, may save money initially, but it requires more frequent changes and provides less protection to the equipment, which could shorten component life. For many companies, the short-term savings simply aren't worth the long-term cost risk. "Some companies don't realize that they may be able to reduce their overall maintenance costs significantly by spending more up front on better quality lubricants," Saffell says. "Their equipment may last longer and they are likely to see lower energy costs."

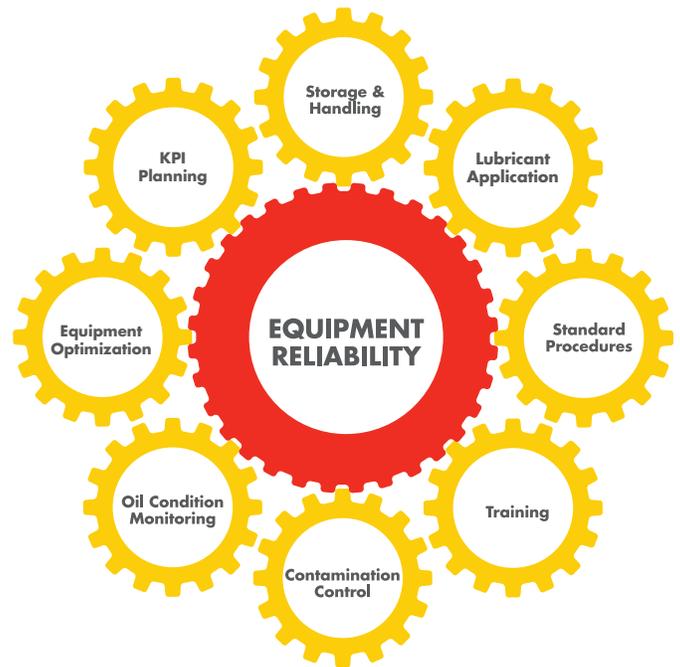


## THE RELIABILITY APPROACH

At Shell, we approach this total cost of ownership by identifying eight distinct factors that turn the wheel of equipment reliability, and we examine each of these factors when assessing a plant's need:

- Proper storage and handling of lubricants
- Accurate lubricant applications – making sure the oils and greases match equipment operating conditions
- Standard procedures for maintenance and operation
- Training to ensure workers know how to properly maintain equipment and what lubricants are required
- Contamination control to reduce particulates, water, and other contaminants that can reduce equipment life
- Oil condition monitoring to ensure the healthy condition of oil and lubricants
- Equipment optimization to get peak performance between maintenance cycles
- Maintenance planning based on key performance indicators

"We take into account all the categories, and we make sure that the customers aren't missing anything," says Wayne Lewis, a Shell senior consultant. "We're not just looking at products as a solution. There's more to improving the customer's lubrication program than just products."



## RISK TOLERANCE

In developing a TCO program, it is helpful to think of equipment reliability the way financial advisors think about saving for retirement. Customers should ask themselves what sort of risk they are comfortable with when it comes to maintenance, says Jeff Wood, a Shell Lubricants technical adviser. To determine this factor, Wood recommends that customers ask themselves key questions about their operations, such as:

- "Am I concerned about manufacturers' warranty claims or am I willing to shoulder responsibility for equipment reliability internally?" If an equipment manufacturer's warranty is important, then a TCO program should ensure that the factory-specified lubricants are used on each piece of equipment.
- "How many different types of grease do I want to maintain?" Some companies prefer to use one general-purpose grease, while others want to optimize greases for different motors or machines. If they use one grease type for all their equipment, some manufacturer guidelines are likely to be overlooked.
- "How effective is my training?" Do their people know the lubricant specifications for the equipment they maintain? Do they follow the maintenance schedules? Do they understand the importance of contamination control, and do they take the proper measures to avoid contamination?
- If they use multiple grease types, what processes do they have to ensure they are applied properly to the right equipment?

Wood says the challenge in developing a TCO program is minimizing the number of lubricants and maximizing their applications. By assessing a company's risk tolerance, it is possible to find the proper balance while enhancing long-term reliability at a low cost.



## **STORAGE AND CONTAMINATION CONTROL**

Contamination control is one of the biggest challenges in maintaining hydraulic systems, says Carlos Robles, a reliability engineer for ArcelorMittal. This includes keeping fluids clean during storage and transfer, maintaining clean valve change-out procedures, keeping exteriors of the hydraulic reservoirs clean to prevent particulates from getting into the fluid, and changing both the breather and in-line filters on a routine basis.

For systems that operate in dirty environments, maintaining cleanliness can be particularly challenging.

Contamination, especially particulates in hydraulic systems, can lead to premature wear and corrosion, which can shorten equipment life. These issues can mean higher operating and replacement costs, and more downtime for maintenance.

“Everybody struggles with contamination control,” Wood says. “Sometimes it’s particles, sometimes it’s water, or sometimes it’s a combination of both.”

An effective TCO program can help spot possible contamination by reviewing internal processes, such as lubricant storage and handling procedures, as well as identifying leaks or other challenges with equipment operations.

When Saffell walks through a plant, one of the first things he checks is the storage reservoirs. Often, contamination can be avoided just by ensuring the reservoirs are covered and the lids are sealed to prevent contaminants from creeping in. He also checks the breathers to make sure they’re functioning properly.

Industrial systems can be complex, and leaks – especially small ones – may be difficult to find. Sometimes, companies accept some level of leakage and recognize they may have to replace hydraulic fluids more frequently, says Michael Darr, a technical adviser with Shell Lubricants. Unfortunately, more frequent replacement drives up costs, and a company may switch to lower-grade fluid to save money.

A system audit and infrared surveys can spot leaks and other inefficiencies in the system that may have gone undetected. By sealing the system and improving the quality of the fluid, companies potentially can save money in the long run and extend equipment life.

An effective TCO program, however, extends beyond just lubricants. It will factor in other aspects of the system, such as filters. Is the company using the correct grade of filters? Are the filters being changed at the appropriate intervals? Are filtration practices achieving the necessary system cleanliness?



## TRAINING, INTERNAL CHALLENGES AND BUDGETARY CONSTRAINTS

While maintenance managers may understand the benefits of a TCO program, it could be more difficult to convince purchasing managers of the need to invest in higher-quality lubricants. Robles recommends using data to illustrate the tradeoffs. "I would show them test data comparing the results of a high-quality versus a low-quality lubricant," he says. "I would also provide them with the cost per hour if a facility would be unable to operate due to a lube-related failure."

Budgetary concerns are not the only internal challenges companies may face. Reducing the cost of equipment ownership and boosting reliability also requires a cultural change in many organizations. A big challenge can be changing people's attitudes as they often do not consider oil quality or cleanliness until there is a problem.

Training programs should focus not just on how to service equipment, but also on the need to avoid contamination and ensure that the correct fluids or greases are applied to the corresponding components. Maintenance workers – not just managers – should share in the holistic view of equipment reliability.

## BUILDING BETTER RELIABILITY

The benefits of TCO are not always immediately obvious. For example, a company can install a new pump, and it may run for months or years even if it is not properly lubricated. Over time, however, pumps will have to be replaced more frequently than those that are properly maintained. A poorly maintained pump can still fail even if the maintenance program is improved after damage has occurred.

Equipment's tolerance to poor or lax maintenance can make it difficult to demonstrate immediate tangible benefits of a TCO program.

"A TCO program may not provide instant feedback," Wood says. "But it helps customers put small steps into perspective and understand how they can lead to big savings in the long run."

The biggest benefit, however, comes from spotting potential problems before they happen. Companies that implement and follow a TCO program can avoid unexpected downtime and reduce or prevent potentially expensive repairs or replacement of equipment.

With a little detective work, an effective TCO program can have a dramatic effect on reliability and generate significant savings in long-term maintenance and equipment costs.

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