

Lubrication – A strategic part of asset management



by John Kitchens

Project Manager
Bently Nevada Corporation
e-mail: john.kitchens@bently.com

In the process industries, where maintenance and reliability methods abound, “Best of Class” companies use proactive maintenance and reliability programs to achieve high availability levels of equipment. Many of these companies’ process facilities reportedly attain ROIs (Return on Investments) in the neighborhood of 16%. These methods have their own names: Planned, Proactive, Corrective, Emergency, or Breakdown. This makes it difficult to decide which techniques or programs to use. As maintenance strategies are selected for managing mechanical assets, three elements should be included. A program should (1) be proactive, (2) be tailored to your company, facility, and type of equipment, and (3) include a strategic lubrication program.

The importance of lubricants free of all contaminants cannot be overstated. (See related article, “Clean up your oil and keep it clean!” on page 9.) Many components of the machines that daily affect us, both directly and indirectly, operate on a thin film of lubricant. These lubricants are specifically formulated to reduce the friction and/or

wear between contacting surfaces in machine components. As such, everyone depends on lubrication in some form or fashion, from the simplest mechanism to the most complex.

A few examples:

- Disc drives (computer hardware).
- Power generation and refining machinery (turbines, generators, pumps, etc.).
- Food processing and textile machinery (mixers, looms, spinning machines, etc.).



- All forms of transportation (automobiles, trucks, trains, ships, and airplanes).
- Household appliances (vacuum cleaners, washers, dryers, mixers, etc.).

The importance of a well-planned lubrication strategy

Lubrication problems are one of the more common issues associated with mechanical assets. Whether it is a misapplied lubricant (formulation or viscosity) or a lubricant losing its effectiveness, lubrication problems can be a source of machinery downtime or lost production in the process industries. A well-planned lubrication strategy contributes to equipment availability.

A strategic lubrication program, including lubricant analysis, can:

- Optimize the performance of lubricating fluids and equipment availability.
- Protect operating equipment against excessive and/or premature wear.
- Eliminate or reduce plant delays and downtime.
- Reduce maintenance expense, thus lowering overall operating cost.
- Extend the lubricant’s usable life, which reduces the amount of lubricant requiring disposal.

Such a lubrication program involves the review and evaluation of lubricant selections for specific applications. Another program element evaluates which lubricants can be used in a larger equipment population, to take advantage of bulk purchases and reduced storage needs, without compromising

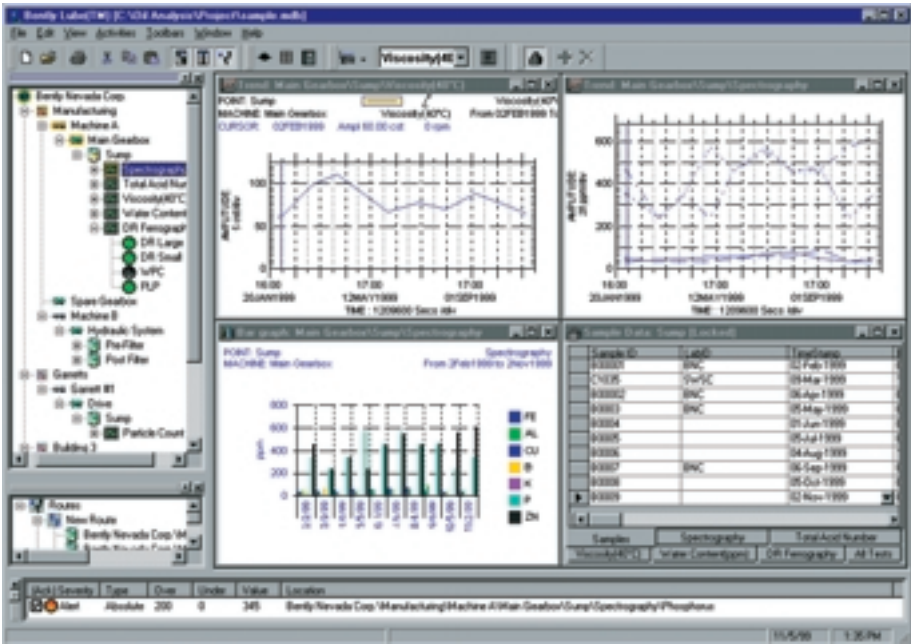


Figure 1. Software tracks and trends oil analysis data.

Bently Nevada Lubrication Services

Our Lubrication Services offerings can be tailored to fit your needs and can be divided into three basic categories: lubrication program administration, lubrication consulting services, and lubrication analysis.

Lubrication Program Administration

This is a “turnkey” level of service whereby Bently Nevada provides all resources for program management, documentation, supervision, and the expertise required to plan and/or manage a system-wide (plant-wide or company-wide) mechanical asset lubrication program. A Bently Nevada Project Manager will be assigned to function as Program Coordinator for the following responsibilities:

- Establishing and maintaining “best practices” relating to lubrication, which are customized for critical machinery or desired results.
- Performing/coordinating/managing both lubrication consulting services and lubricant analysis services.
- Integrating lubrication technology into asset management programs for equipment reliability, such as:
 - ▲ Vibration Analysis/Predictive Maintenance.
 - ▲ Condition Monitoring.
 - ▲ Root Cause Failure Analysis.
- Managing relationships with lubricant suppliers.
- Researching lubricants, and establishing, publishing, and maintaining an up-to-date lubricants cross-reference.
- Advancing lubrication technology using:
 - ▲ Bently Nevada engineering and development.
 - ▲ Bently Rotor Dynamics Research Corporation

individual equipment requirements.

Once proper lubricants have been specified and implemented, a lubricant analysis program should be implemented to obtain the optimum life from the selected lubricants. Lubricant analysis is a proactive maintenance tool used to monitor both the condition of lubricating fluids in process machinery and the condition of the process equipment. An effective analysis program involves:

- Selection of the type of tests to be performed.
- Selection of the optimum sampling point(s) for each piece of equipment.
- Procedures for collecting representative samples.
- Procedures for minimizing sample contamination.
- Interpreting/managing the data from the laboratory.

Matching a lubricant to the application and monitoring its condition can optimize the lubricant’s performance

and maximize machinery availability.

One of the benefits of lubricant analysis is extended drain intervals, which addresses two issues: (1) the increasing cost of lubricants and (2) the cost of proper environmental disposal of waste (used) oil.

In some cases, drain intervals may be shortened if the lubricant is degrading more quickly than expected. This is not usually detrimental since reconditioning the lubricant or changing it can still extend the operating life of the equipment.

An effective lubrication program requires a knowledge of the correct use of the lubricant and the machinery or equipment it lubricates. Actual machine condition can now indicate when maintenance should be performed. In addition, lubricant analysis can provide valuable insight into the particular mechanical components needing, or not needing, attention during a maintenance turnaround.

lubrication-related research.

- ▲ Awareness of advances in lubrication industry technology.

If you need someone to assume responsibility for your entire lubrication program, this level of service is appropriate.

Lubrication Consulting Services

If you already have a lubrication program in place, but would still like outside assistance to assess it and make recommendations, we can also help. Our consulting services in this area can provide the following types of assistance:

- Review and evaluate lubricant selections for specific applications.
- Evaluate applications to determine which lubricants can be used in a larger equipment population to take advantage of bulk purchases and reduced storage needs without compromising individual equipment requirements.
- Resolve lubrication-related failures using root cause failure-analysis techniques to eliminate future failures caused by similar circumstances.
- Perform site or operating-unit lubrication surveys to evaluate:
 - ▲ Lubrication programs/systems and recommend appropriate changes.
 - ▲ Appropriate application of lubricants to individual equipment needs, and recommend changes if required.
 - ▲ Proper lube storage techniques.
 - ▲ Lubrication purchasing strategies.
- Provide lubrication training for customer personnel and contractors in both formal classroom settings and informal field settings.

Bently Nevada can supplement your current program with our expertise on a one-time or ongoing basis.

Lubricant Analysis Services

Lubricant analysis is a proactive maintenance tool used to monitor the condition of lubricating fluids and process machinery. Some customers may already have a lubrication program and strategy in place and simply need someone to actually conduct the lubricant sampling and analysis program.

Summary

Lubrication assessment is an integral part of a complete machinery management program. Bently Nevada can provide a comprehensive range of services related to lubrication, whether it is a complete “turnkey” approach where your entire program is outsourced to us, or some subset that may only entail a part of your total program. Because we are experts in rotating and reciprocating machinery behavior and maintenance, we can approach your machinery from more than just a lubrication-related perspective. Our experience and worldwide presence allow us to provide this valuable service as a natural extension of our other machinery management consulting services.

To learn more, contact your nearest Bently Nevada sales or service office. [↻](#)