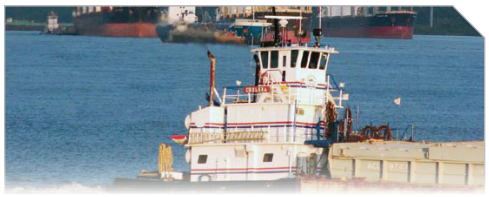
COURTESY OF the WATERWAYS JOURNAL

BUFFALO MARINE UPGRADES LUBRICANTS TO LOWER COSTS AND IMPROVE RELIABILITY



Buffalo Marine Service Inc. of Houston, Texas, specializes in bunkering ships along the Gulf Coast from Lake Charles, La., to Corpus Christi, Texas. Buffalo Marine owns and operates nine tugs, has two under construction and has six more independent tugs under contract. It also owns and operates 20 bunkering barges and four line-haul barges, making Buffalo Marine the largest provider of bunkering services on the Gulf Coast. Buffalo Marine's major position in this market has been led by its commitment to service and its willingness to readily explore innovative technologies.

In 1990, Buffalo Marine, in conjunction with Stewart & Stevenson, built the San Gabriel, the first electronic-controlled tug, which has revolutionized the industry. In 1993 it built the Buffalo Star, the first barge that could function as a floating terminal by blending fuels on delivery using a Waugh controller and Micro-Motion meter. Buffalo Marine was also the first company to use Detroit Diesel Series 60 engines in marine service and it has designed custom bunker booms that can deliver two products (both a clean and dirty fuel) simultaneously. Previously, it was necessary for ships needing both types of fuel to be serviced by two different bunker barges. Buffalo Marine has also been an innovator by equipping its barges with two engines and two pumps to expedite quicker turnaround times for the ships it serves (six-hour turnaround vs. 10-12 hours).

In 1994, Buffalo Marine sought to attain operational improvements by upgrading the quality of its lubricants. Based on the experiences reported by Eddie Howard with Field Services Equipment Company, Buffalo Marine elected to upgrade its engine oils to Royal Purple's high-film-strength, long-life lubricants. As part of this change, used-oil analysis was begun on all engines to enable Buffalo Marine to collect enough data so that we could make an informed choice about safe oil-change intervals with the new oil. Ultimately, it was determined that oil and filter change intervals could safely be extended from the existing 300 hours to an oil change every six months, regardless of the number of hours of operation. For some barges, this could be as long as 1,000 hours between oil changes. An exception would be made if the oil ever appeared to be dirty on the dip stick, in which case only the oil filter would be changed. Subsequent to changing the oil filter, the oil would again look clean on the dip stick. The use of used oil analysis was suspended immediately after establishing the six-month oil-drain intervals, which have been ongoing for the past 12 years.

The first observation after changing to Royal Purple's SAE 40 motor oil was that engine operating temperatures dropped 5 degrees F. An additional benefit was that fuel efficiency increased by 3-5 percent. About this same time a V12 Twin Disc gear on the tug St. Thomas was experiencing high wear. The service representative for the vendor advised that we change it out as it only had six to 30 days of life remaining. Instead, we elected to change the oil to Royal Purple and leave it in normal service. After changing oil, the gear quit generating wear particles and remained in normal service for nine more months.

Occasionally a broken hose will cause a low-oil-pressure alarm on our Twin Disc gears. Whenever this used to occur, the gear set would be fried no matter how quickly the engine was shut down after the alarm sounded. Since upgrading to Royal Purple high-film-strength motor oil, low-pressure alarms no longer result in gear failure. Repairs are limited to replacing the broken hose and refilling with new oil.

The most significant benefit achieved by changing the oil to Royal Purple was that engine repair costs dropped by 25 percent. In-frame repairs (replacing all pistons, valves and heads) on our engines were common. In-frame repairs have now been eliminated. Also where the service life of a diesel engine used to be about three years, diesel engines of all types are now able to run five to seven years before replacement. These gains have significantly reduced costs and downtime and increased equipment availability.

Based on these experiences, Buffalo Marine Service has upgraded to Royal Purple lubricants in many other applications with excellent results. Maxfilm aerosol is used on all hinges, controls, winch systems, etc., which has provided excellent lubrication and eliminated rust, which is a common problem in coastal environments. Purple Ice additive in the engine radiators has provided additional engine temperature reductions. Syndraulic 46 is used in all booms and steering units while Synfilm 32 is used in all of the Falk reduction gears. Ultra-Performance Grease is used for all grease points. Every upgrade has resulted in improved equipment reliability.

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Buffalo Marine Service believe being an industry leader requires innovation and that innovation is necessary to meet the challenges of a highly competitive and ever changing world. Some innovation can be complex and capital intensive. Others can be as simple as purchasing and using innovative products in place of products you already use. These are the easy ones to implement. But it first requires accepting that meaningful choices exist and often looking past the higher initial purchase price in favor of the higher overall value the product brings to the table. This was certainly the case for Buffalo Marine Service when it elected to embrace a change in lubricants.

About the Author: Pat Studdert is pesident of Buffalo Marine Service and has more than 30 years experience in the marine service industry. Studdert has been recognized as an industry leader by Ernst & Young, Kauffman Foundation, USA Today and NASDAQ, as well as the Propeller Club of the United States and the U. S. Coast Guard.

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ENERGY SAVINGS

Energy costs for rotating equipment are many times larger than maintenance costs. Even a small percentage energy savings can quickly exceed the total cost of lubricant purchases. Here is a case that illustrates this:

A large, Midwestern, coal-powered energy producer tested a boiler feed pump to see if upgrading from a mineral-based lubricant to a purported high performance synthetic would reduce energy consumption. Data on the voltage and draw of the motor powering the pump was collected using MotorSTATUS™ monitoring equipment to determine energy consumption.

It was necessary to know the following to determine any reductions in energy consumption:

- The average full load heat rate as a measure of how efficiently the coal was converted to electricity
- The actual power that the unit generates
- The cost of coal

Benchmark readings were measured over the course of seven days using the mineral oil. At the end of the seven days, the lubricant was changed to the high performance synthetic. The equipment then ran, and was monitored, for another seven days. With the mineral oil, the motor ran at an average of 455.33 amps. With the high performance synthetic, the motor ran an average of 425 amps.

THE FOLLOWING CALCULATIONS WERE USED TO DETERMINE ENERGY CONSUMPTION:

(30.33 A change in amps * 4000 volt motor) / 1,000,000 watts = .12132 MW additional power generated

9581 BTU per kilowatt hour mineral oil heat rate * 238,000 kilowatts produced = 2,280,278,000 BTU per hour coal utilization

2,280,278,000 BTU per hour coal utilization / (238,000 kilowatts produced using mineral oil + 121.32 kilowatts additional power generated using synthetic lubricant) = 9576.13 BTU per kilowatt hour synthetic oil heat rate

(9581 BTU / kWhr original heat rate) - (9576.13 BTU / kWhr new heat rate) = 4.87 BTU change in heat rate

4.87 BTU change in heat rate * 238,000 kW power generated * ($1.26 / MBTU cost of coal) * (1 MBTU / (1 * 106 BTU * 4760 hours of operation per year)) = $6,959.53 in energy savings from one boiler feed pump

The additional cost for upgrading lubricants worked out to less than $260 per year. The internal rate of return on the investment was dramatic with a payback rate of less than one month. The potential energy savings to a plant with numerous pumps could be dramatic as well.

SUMMARY

Companies can make significant improvements to their bottom line by simply upgrading the quality of the lubricants they select and use. To stay competitive, companies must shift their mindset from seeking the lowest cost lubricant to seeking out the lubricant that is most likely to help them improve plant reliability and reduce maintenance costs.

Seeking the best performing lubricant will require some research and the return on investment is well worth the minimal time and effort involved. The first step is to contact your lubricant supplier and / or research high performance lubricant manufacturers to request performance data specific to equipment used in the power generation industry. The next step is simply to choose a lubricant (or lubricants) based on the available documentation, determine performance criteria, and begin testing on a few pieces of equipment. Few changes, if any, can reduce maintenance expenses so dramatically, quickly, and easily as upgrading your lubricants.