

Constructing A World-Class Lube Room

BY SCOTTY LIPPERT, CLOPAY AUGUSTA MAINTENANCE DEPARTMENT

Question: “How does our plant stand on lubrication issues?”

Answer: “We are doing at least one thing right - we are using grease and oil.”

Clopay Corporation Plastics Products is located 50 minutes east of Cincinnati/Northern Kentucky International Airport along the Ohio River in Augusta, Kentucky. Our historic town is known more as the hometown of actor George Clooney than as a leader in the plastics industry. Clopay also has plants in Tennessee, Germany and Brazil. The company manufactures diaper film, breathable film, house wrap and other healthcare products.

It was approximately two years ago when Clopay operations management made the decision to develop world-class maintenance systems. Plant engineers at the Augusta and Nashville North America facilities identified the key areas within the maintenance function that are critical for development of world-class maintenance. Members of the maintenance department were assigned leadership responsibilities in the critical areas (such as alignment, vibration analysis, calibration and root cause failure analysis). My assignment in this effort was leader of lubrication. I wondered, what could there possibly be to pumping a grease gun or draining and filling a gearbox with oil? I felt lucky to be assigned to this area, compared to some of the other areas. Little did I know at that time all that was involved. I thought we had an above-average lube program in place and that this assignment would be a simple task. I have certainly learned better.

Lubricant Supplier Selection

The first task was to select a lubricant supplier we could count on. I met with three oil companies, but could not comprehend what they told me, which ones were honest in their intentions, or which ones were just looking to make a few bucks.

Continued on Page 44



My manager and I started looking into a training program that I could attend. In our search, we were repeatedly directed to Noria training courses. In February 2002, I attended my first Noria seminar. This was probably the most educational three days of my professional career.

After returning from the training, I met with the three oil companies again. This time, we asked each company for references, made follow-up calls and visited the various facilities listed as references.

Clopay is an ISO-certified company with a strong commitment to customer satisfaction. Our customers periodically visit our facilities to audit our operations. During such visits, at least two of our biggest customers strongly suggested we use nontoxic (food-grade) lubricants in our machines. We made it clear to the oil companies we visited that we required food-grade oil. This helped eliminate some of the companies which did not specialize in food-grades.

We selected an oil company, developed a plan of action, and set a date to start a lube survey of the plant. The consultants, other maintenance personnel and I spent eight days throughout the plant performing lube surveys, recording findings and reviewing current procedures. Our findings convinced us to switch from a mineral oil to a nontoxic synthetic oil throughout the

plant, including oil for ceiling fans, fire doors and the biggest machinery.

Lube surveys stimulate a great deal of research. It is important to conduct a lube survey before building an oil room because chances are you will be able to consolidate some oils and greases. Before buying an Intermediate Lube Stores system, you need to know how many carts and holding tanks you need. The room must be built to accommodate the new equipment sizes.

The survey will determine the equipment needed, square footage required and an efficient inventory level for oils and greases by type in use. Researching oil reservoirs and gear boxes should provide enough information to estimate how many gallons of oil must be purchased to convert the plant.

After following these procedures, my manager and I had enough information to develop a cost analysis for our proposed changes. We could then develop projected costs, analyze projected cost savings and present a clear picture of proposed changes to the corporate office for review. It is important for the people at the corporate level to understand the bottom line - how these changes affect profits. Without such support, your plan will go nowhere. Our team worked from February to July just compiling the data into a detailed plan with projections. After presenting our plan to the corporate office, we were given 100 percent support to implement it. Getting buy-in from corporate, we were ready to begin the next stage - implementation.

Lubricant Dispensing Tote Rack

We ordered an eight-tank Innovative Fluid Handling (IFH) system and seven IFH carts. We modified the carts to fit the system to our machinery needs. In doing so, we eliminated three oils and one grease from the inventory. Additionally, we ordered two more holding tanks in anticipation of future needs based on current and projected plant growth.

We purchased a couple thousand dollars worth of Des-Case desiccants and also

Continued on Page 46



Continued from Page 44

several dollars worth of Donaldson three-micron filters with manual indicators. We also purchased a Fluid Power Connection filter cart. I bought these particular brands because I had local vendors who were distributors.

After ordering the equipment, we began to build and prepare the oil room. Our research reaffirmed that we needed to locate the most particle-free area while still being as close as possible to the receiving department for easy access. The area selected is located over a basement. For safety reasons, we covered the floor of the room with two coats of protective sealant in the event of a major spill. The room is secured with built-in cameras and is accessible only with a security card. Only those employees with lube training have access.

The camera provides viewing access to the room with screens located in maintenance areas (such as machine and electric shops) throughout the plant. If a question arises about items seen on screen, the user may ask the closest maintenance associate to guide him or her through the inventory. The screens are used for training and allow people to view the inventory without physically entering the area. The room is additionally secured with explosive-

proof lighting and receptacles. A climate control system maintains the recommended temperature of 68°F.

We ordered the IFH system with only one electric pump, and then installed diaphragm pumps for each container. Each container is equipped with three-micron filters. The diaphragm pumps are designed to pump viscosity of 220-gear oil. For the 460-gear oil, we use the electrical pump. The stronger pump is required to get a good flow rate with the three-micron filters we installed. Instead of ordering a spill pan with the unit, we installed a custom-made stainless steel pan.

We constructed a platform on the side of the system to mount additional pumps as needed. Mounting brackets for the filters were built and each filter was attached to a manual filter indicator. Each row of tanks was connected to a desiccant breather on the side and a three-fourth inch fast-disconnect (Dyna-Equip) to each pump and holding tank was installed.

The system's fill valve, made for lower viscosity, has a check valve which permits fluid to be pumped in but not out. We removed the check valves to allow the fluid to be pumped out. Installing the fast-disconnects with built-in check valves enabled us to pump fluids both in and out. By changing some hoses on the system, we can use our pumps to fill the tanks or to pump out into our carts. This system is designed to eliminate cross-contamination of the oil.

Every pump, hose, disconnect, tank, cart, shelf, Oil Safe® container and storage space for carts is color-coded for compatibility. Additionally, each part is tagged with a written description of its function. If the hosing is modified, check the inner tubing material to ensure measurements such as pounds per square inch, gallons per minute and temperature range are acceptable.

Selection of Filter Carts

The oil carts I described were modified to perform two functions: to pump fluid out of the IFH containers and to pump it into the oil reservoirs. Fast-disconnects and hoses were added.

Continued on Page 48



Continued from Page 46

Containers and color-coded tags match tanks and gear boxes throughout the factory. Close tolerance filters and manual filter indicators were also added to the carts. This structure allows oil to be filtered twice, when going into the tanks and when coming out. Plastic wands were also replaced with stainless steel wands on the carts. Lint-free towels and towel racks are mounted to each cart.

Each parking place for carts is color-coded and marked on the floor cap to the height of the cart. Labels are placed on the wall, cart, hoses and floor to prevent confusion. In our experience, the diaphragm pump ordered with the carts did not supply sufficient flow with the added micron filters, and some gearboxes had considerable pipe distance to pump into. To solve this problem, new pumps designed to pump oil were purchased and installed.

Our Oil Safe® containers are clearly marked with labels to match the carts and tanks. Oil sample pumps and funnels are color-coded for each oil and stored in ziplock-type bags. We use two oil sample pumps for each oil: one sample pump for pulling samples from new oil

shipments and one for pulling samples for oil of the same type in the gearboxes.

The middle part of the grease guns are color-coded. Each grease gun was calibrated and labeled by pumping once and weighing the sample. This is done three times; first in grams and then by taking an average of the three and converting to ounces. The results are labeled and stored in the cabinets with dust caps attached. Grease guns are color-coded to match zerk caps on machinery.

Hard copies of the documented work practices are laminated, then attached to bulletin boards in the oil room, as well as placed in binders. The master copy of all work practices is a controlled electronic version accessible on the plant's computer network system.

We've performed a lot of gearbox and reservoir flushing while changing the oil throughout the factory. Fifty-gallon drums are purchased and a drum dolly with a mounted diaphragm pump carries the drum and pump right to the reservoirs that will be flushed.

Waste Oil Management

All of the oil changing and flushing created another challenge: storage for waste oil. In the past, we put the waste in 50-gallon drums. To solve this problem, we purchased two 320-gallon totes and built a spill-holding tank under them. We built metal skids under the tanks so tow motor forks would not puncture the tanks. Fast-disconnects are installed on top of the totes for filling. The three-inch ball valves for draining have locks to prevent accidental spills.

Our experience taught us that a }world-class lube room is not built overnight. The planning and research required is more time-consuming than the actual construction work. When planning your own lube room, be sure you have the resources at the corporate level to support you or you will not succeed. As we pointed out to those at our corporate level, preventing cross-contamination of oil, particle contamination, and water contamination along with selecting the right lubricants and applying them right are important tasks. Don't expect all these changes to happen overnight. **ML**

