Lubrication best practices for heavy industries

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Lubrication in its basic form is there to reduce friction between two surfaces during motion. However, light and heavy industrial applications require a whole different approach if reliability and equipment availability for production is required. Heavy industrial applications mean just that...heavy duty, critical and expensive equipment is in place. Plants that operate around the clock 24 hours a day and almost 365 days of the year fall into this category as the market demands do not allow for plant stoppages. This then means that the cost of a plant stoppage is very costly from a customer perspective due to product availability in the market as well as cost of repairs to the manufacturing plant. It is then the reason why such plants have to stay operating at all times where possible.

The approach to lubrication has long been taken a little casual. Executives and senior managers at various plants are always in the dark when it comes to what the real causes of equipment failure are. With only about 1 - 2% of a plant operational budget going to lubrication, poor lubrication practices account for over 50% of most equipment failures. This leads to unscheduled plant shutdowns leading to leading to huge losses and missed production targets.

To address lubrication in heavy industrial applications, it is best to approach it from how lubrication as a maintenance practice should be dealt with.

1. Your Grease Technicians should be your top technicians

Great companies know and hire the best and smartest technicians in charge of lubrication. They understand that the most knowledgeable technician will do the right thing at all time or will seek for better answers and solutions when tasked to do lubrication. Manual lubrication has for a long time and still continues to be the basic and most common way to lubricate equipment. It is generally considered to be the cheapest method from an investment point of view. With this in mind, it is also assumed that it is not complicated at all and as such anyone can do it more so those seen as lazy and not very useful to the plant. As such disgruntled employees or lazy employees who hang on a thing thread and likely to be sacked at any moment are given lubrication roles to avoid lawsuits and or finding him something to do at the plant. That has been the attitude that has been existing in many plants around the world. However, this has come at a cost and a very costly one for that matter. Most of the plant failures have been attributed to is approach. The good for nothing employees are the ones tasked with the responsibilities to take care of expensive and critical plant equipment. Would you want your car serviced by the least knowledgeable mechanic? But isn't this the approach at our manufacturing plants?

It is time that the role of lubrication technicians is for the best technicians and not for the worst. Award winning technicians will give feedback, seek answers, read manuals, ask questions, push for the right equipment and do what it takes to ensure failure is not in their area of responsibility.

2. Follow the Lubrication Instructions in your Equipment Manuals

Lubrication of heavy machinery is more technical than it is always assumed. Most equipment supplied by original equipment manufacturers comes with lubrication instructions for all critical parts of the equipment. This includes quantity of grease per lubrication point as well as the frequency. The equipment manufacturer believes that by following these instructions religiously, your equipment is well served to it well lubricated and functioning at its best. This, however, is not the case after the equipment is purchased and in production. Over-lubrication, the lack of or missed lubrication opportunities, contaminated grease or oils are what this expensive and critical equipment that cost millions will get. Soon, failure of different components of the machine start and so is production affected and the life of the equipment. Blame is then directed to the new machine that it is not as good as the previous one yet the machine requires more frequent lubrication because of a new technology that comes with more critical parts. Yes the old equipment seemed to last longer.

However, at the time, we did not require all the extras we need with new equipment. Therefore, we keep handling new equipment the same way we handled the last equipment purchased in the 60s and 70s.

3. Are you using the right lubricant as per the OEM?

The O&M Manuals indicate the type of lubricant required for each lubrication point. They will usually give a range of lubricants suitable for the application. The reason being that lubricants are not the same. A high pressure, high temperature grease is very different from a general bearing grease. A general bearing grease applied in a high temperature area will disintegrate almost immediately thereby leaving the lubrication point dry and wearing almost immediately. Temperature is one of the main causes of reduced life of equipment. As such, using the right lubricant ensures that even at high temperatures, the

grease remains intact and provides protection of the surfaces during operation and therefore guaranteed life of the equipment.

Using or procuring the right lubricant at all times comes at a cost. Some of these lubricants may not be readily available in stock or may be quite expensive. As such, the use of the right lubricant is changed by a supervisor or engineer and that becomes the beginning of the failure curve. We disregard that the OEM had a reason for specifying a particular

lubricant. What we do not see is that the cost of poor lubrication is never immediate.

4. No failure exists without a cause. Why?

When an equipment fails, do we ask the whys until we establish the real cause of the failure was? I can guarantee you that we did, a lot of failures could be avoided over time. There is no failure without a cause.

Asking why is likely to establish some of the following issues in the lubrication program

1. Wrong re-lubrication frequency. The O&M manual may probably requires daily lubrication.
2. A locally available oil or grease that does not meet the OEM specs may have been used temporarily for lack of stocks but over time has become the standard lubricant.
3. Manual lubrication may not be practical because an equipment is too critical to the plant process or the number of lubrication points are too many to be effectively manually lubricated.
4. The technician has no training and does not understand how critical it is to follow the right lubrication procedures
5. The equipment is not working well and the technician cannot tell how much grease has gone into the bearing
6. There is lack of a proper lubrication schedule which leads to numerous missed lubrication tasks and opportunities.
7. Some lube points cannot be lubricated when the machine is operating. As such it is done only when the machine stops which rarely happens as there is no scheduled stoppage.

The list may be very long. However, there is success in sight. The manager now has a way to proceed to stop this from happening again.

1. The O&M manual is now followed to the letter.
2. The right lubricant is ordered from wherever it can be found and enough stocks kept.
3. Upgrading to automated lubrication systems
4. Lubrication training is now offered to the whole technical team
5. The right lubrication equipment is not in place
6. A lubrication management program with tracking and daily task scheduling is put in place.
7. Inaccessible points are brought out so that they can be lubricated while the equipment is on the run.

5. Use Oil Testing & Filtration Services

Solutions to huge oil savings exist for heavy industries. Oils are expensive and are used in large quantities to keep the plant running. As such many plants have lots of used oil sitting in drums waiting for disposal. However, all the used oil collected is not always bad enough to be disposed. A lot of it can be reused after doing the following.

Oil Testing Services - These are readily available services used to test the oil samples to establish if the viscosity and other properties of the oil are still within an acceptable range. Oil testing services also tell what may be going wrong inside the equipment. The results tell us of wearing parts inside which will not be visible due to presence of metals. The oil may just contain contaminants and water which can be filtered.

Oil Filtration Services - If the oil test results indicate that the oil has contaminants and the properties are within an acceptable range, oil filtration is an option. Oil filtration systems exist for filtration of different viscosity oils as well as quantities. Not many companies currently offer this service. However, it is available. It may also make dollar sense to purchase a filtration system for in house use. Huge savings can be realized with such equipment.

6. Is Automated Lubrication for you?

Heavy industries are faced with unique challenges when it come to lubrication. As such a lot of them end up considering automated lubrication as a solution to solve some of these challenges. Whether automated lubrication if for you can be established by considering the following;

1. Do you have critical production equipment whose failure is not an option?
2. What is the frequency of re-lubrication of your critical equipment? Can this be effectively achieved manually?
3. Are the lube points too many for practical manual lubrication
4. What is the cost of lubrication related failure to this equipment?
5. Is the environment very harsh for the equipment due to dust, water or other substances?
6. Are the lube points quite inaccessible or unsafe to access during normal operation of the equipment?

These are simple but critical questions that should help you weigh the need for automated lubrication systems for you equipment. These systems start from low cost but effective automatic single point lubricators to completely automated lubrication systems that can lubricate hundreds of points.

In Summary

Proper lubrication is key to keeping a plant operating optimally. There is no special engineering involved. Just proper lubrication practices. It also means that it cannot be left to just anyone to handle. Top manufacturing plants all over the world are now hiring or creating a Lubrication Champion Position in their organization to lead lubrication practices. The Lubrication Champion's roles include but not limited to developing, implementing and maintaining an effective lubrication program, keeping track of lubricant stocks, product handling, cause and failure analysis investigations and finally reporting and advising senior management on the lubrication status of the plant. They are answerable to all lubrication related issues of the plant. With accountability comes performance and results. Is your plant there yet? ■

Lubrication is not expensive. It is essential. Just as blood is. Try to do without it.