

More lubrication knowledge means more grip on assets

Maintenance Engineer Manuel Draijer wants to keep the Overall Equipment Efficiency at Frisia Zout as high as possible. He therefore decided to train both the mechanics and the operators in the field of lubrication maintenance. Kees Oskam of Van Meeuwen Education first collected practical examples in the factories of Frisia, started with the foundations of lubrication maintenance, but mainly tried to get the whys and the wherefores of lubrication maintenance into everyone's heads.

Frisia Zout's production site in Harlingen is located next to the Wadden Sea. Large reaction tanks, evaporator installations and warehouses define the appearance of the site. However, the company's most valuable asset is located three kilometres underground. This is where the salt lies, which serves as a raw material for various plastics and chemical products, but also for lick blocks for livestock, water softening and table salt. The company extracts the salt by injecting hot water into the salt

source and pumping up the brine that is created - water with a high concentration of salt. In large reaction tanks on the site, lime and magnesium are removed from the brine, which is then evaporated, dried and further processed in five steps.

Overall Equipment Efficiency as high as possible

It should come as no surprise that the assets involved in production can be adversely affected. It is well known that salt is highly corrosive. Nevertheless, Manuel Draijer manages to keep the assets in good condition. Together with a technical team of 25 people, supplemented by a number of external technical experts, he keeps the Overall Equipment Efficiency as high as possible. "We carry out preventive maintenance as much as possible, so that the assets can produce when they are needed," says Draijer. "If something does happen to get stuck, we'll analyse what caused it. The same applies to recurring failures, because they are also subjected to a thorough root cause analysis for learning purposes. We have recently implemented SAP PM as a maintenance management system and



Manuel Draijer: "By carrying out preventive maintenance, you can prevent unplanned downtime. Knowledge of the correct use of lubricants is really helpful in this respect."



are now in the process of recording the maintenance history of the most critical assets."

A form of preventive maintenance that should not be underestimated is the regular lubrication of the rotating parts of the machines. Draijer shows the lubrication schedule of all assets from the SAP program: a stack of documents, as thick as four old-fashioned telephone directories. "We have a lot of rotating parts, chains, gearboxes, pumps, bearings and agitators. We know for each asset, what type of oil or grease, when and in what quantity it should be lubricated. We have linked the Van Meeuwen SJMAXX® digital lubrication schedule program and app to SAP and receive regular feedback from Van Meeuwen if they think we can carry out lubrication in a smarter manner. Still, I had the impression that not everyone was on the same page. In addition, we wanted our operations department to carry out more front-line maintenance, and lubrication maintenance is part of that."

More attention to lubrication maintenance

Draijer already had good contact with Van Meeuwen and in consultation he decided to have both the technical team and the operators trained in the field of tribology (wear and friction). Kees Oskam is a Trainer with a lot of technical experience at Van Meeuwen and as such is also a Consultant at Van Meeuwen Education. "The fact that many technicians aren't lubrication

experts isn't really to blame," says Oskam. "Most technical courses pay little attention to tribology. If a textbook spends one page on lubrication, that's already a lot. This is even more true for operators. They are trained to manage processes, but that doesn't usually include conservation and lubrication maintenance."

In practice, he sees a lot of room for improvement. "Lubrication maintenance requires discipline. For example, if you don't work clean, you can cause damage to a machine. Especially under the conditions in which Frisia works, a contaminated grease nipple can literally bring salt into the gears. You will have to clean it before you place the nozzle on the grease nipple." Draijer: "On the advice of Van Meeuwen, we have already purchased new nozzles which you can easily place on the nipple by means of a mechanism and thus have two hands free to operate the hand lever grease gun."

Oskam was asked to provide in-house training at Frisia for a number of groups of operators and mechanics. "We consciously opted for a mix of both groups because it also creates an understanding of each other's points of view," says Oskam. "If an operator understands that his lubrication work not only increases the reliability of his machine, but also allows a mechanic to focus on technical improvements, he will get the point. Conversely, operators are often the first to detect irregularities in a machine and are therefore invaluable to mechanics."



Manuel Draijer, Frisia Zout
and Kees Oskam,
Van Meeuwen Education

Practice is central

Before Oskam stood in front of the "class", he first collected practical examples in the factories of Frisia. "I take pictures of machines, the lubrication room and, for example, grease guns to show what I find. That can sometimes be quite confrontational. Because not everyone is equally careful with the equipment and machines. Or someone takes the last litre of oil and forgets to make a note of it, with the result that no new product is ordered. Such a first check can already be the first step towards improvements. That's how I found out that the rules were not being followed as carefully on the weekend as they were during the week."

After this assessment, the real training begins: "I will first explain the fundamentals of the different types of oil and grease, their influence on, for example, rolling elements, gearboxes and what friction is, how wear occurs and in what form. The problem with lubrication is that the result of your efforts is not immediately apparent. But if you don't do it seriously, you'll end up with problems."

Kees Oskam: "How often does it happen that people simply follow the lubrication schedule, when a machine may not have been in operation for a week?"

If you know why you're doing something, it'll come into your consciousness sooner and you'll make well-informed decisions, says Oskam. "How often does it happen that people simply follow the lubrication schedule, when a machine may not have been in operation for a week? The other way around is also possible: when a machine has been fully cleaned, you may need to add twenty grammes of lubricant instead of the prescribed four grammes. How successful this is, can also differ. And while you're busy lubricating a machine, you should also take a look at what the used grease looks like. For example, if you're using red grease and it comes out of a machine with a grey colour, there's probably water in the grease. Brown often means rust and black indicates wear and tear. This is all information that an operator or mechanic can use during lubrication to determine that something might be wrong."

Time savings, reliability and productivity

In any case, Draijer has been satisfied with the results of the training sessions and is already thinking about a follow-up: "We are making a start on Total Productive Maintenance and want the operators to take greater ownership of their machines. This includes first line maintenance such as cleaning, inspecting and lubricating machines. We have recently been given permission to develop a new salt source, which will place a heavier burden on the assets than in recent years. We are therefore working hard to upgrade parts of the factory with better and more durable materials. The assets that we'll be using at the extraction site are the most critical for the entire company, so we want to make sure we keep them in as good a condition as possible."



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Of course, there is always a trade-off between reliability and productivity. "We prefer to keep the assets running as much as possible, but by carrying out preventive maintenance, you can prevent unplanned downtime. Knowledge of the correct use of lubricants is really helpful in this respect."

By making production and technical maintenance work better together, Frisia Salt can produce more with the same number of people, Draijer explains. "For example, we saw that forklift drivers were waiting a long time before they could load pallets of salt onto a truck. Their time was better spent lubricating the chains of the conveyors, something that normally was done by the technical service. It is those small adjustments and changes in the mindset of people that make the real difference. Since the forklift drivers themselves are responsible for first-line maintenance, you can see that this part of the department is neater and better lubricated than before. It's now, so to speak, their own little corner of the factory."

Mix of theory, practice and internet

Oskam would like to test whether the theoretical knowledge has been put into practice in a year's time. "When you let people change a grease cartridge or lubricate a bearing, you can immediately see if they've made the transition from theory to practice. The aim is not to make people aware of their mistakes, but to help them work even more effectively and do things better. A good example is taking oil samples. You have to work very carefully, otherwise you'll pollute the oil sample and you won't get a valid result. Before you take an oil sample, you need to know if and how long a machine has been running and

from which location you need to take the sample. And then you also need background knowledge about these circumstances in order to be able to draw a meaningful conclusion. Here, for example, they'll probably find salt in the oil samples. In many other environments this would be alarming, but here people are working with salt."

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In the meantime, Oskam is also working on an interactive learning module in which lubrication theory can be tested in a virtual environment. "If you don't use your learned knowledge and skills on a daily basis, you run the risk of quickly losing it", says Oskam. "We are therefore developing a kind of after-care training that allows mechanics and operators to practice the theory in a more playful manner. They can then decide for themselves when they want to refresh their knowledge. By repeating the theory for half an hour a week, you often learn much more than in a block of five days. We also introduce a competitive element to it, so that learning becomes a challenge as well."

