

Doomed pumps brought to life

A sewage plant was due for closure and did not therefore receive maintenance for several years. There was no reason to repair pumps that was going to be scrapped anyway.

Then came the counter-order; the sewage plant would continue to be in use for another 2-3 years. When the decision was made, the renovation requirement became acute.

The solution was to repair and upgrade the sewage plant using the composite technology in an environment where this method normally does not work; the plant had leaking valves and running water.

Today, however, all the pumps are renovated and are functioning without a problem!

The alternative would have been to empty the collecting tanks and demount the pump houses. This would have taken three times as long and partly disrupted the process.

"This would have been unthinkable" commented Bertil Hylén, Maintenance Manager for the sewage plant.

Which method to use was determined after discussing the matter with Jan Hellstedt at SIU. He thought that it was possible to repair and upgrade the pumps with composites even though the running water from the pumps was inevitable.

THE SPECIFIC COMPOSITE that was used can be applied to metal under water. "SIU have carried out similar jobs before so we decided to test this method, and it worked" Bertil Hylén said.

"Today we can demonstrate that nine of the pumps have improved its efficiency by 2-3 percent, a result that we are very pleased with considering the condition they were in when we emptied the tanks. One pump runs with worse efficiency than before the repair but that is probably due to fine adjustments which will be corrected in due course."

ONE OBSTACLE to overcome was the preparation work. How could anyone blast in such a wet environment, knowing that the blasting powder mixed with the water would cause problems?

To solve this problem, SIU used the new blasting method "Sponge-Jet", where the blasting media consists of tiny sponges which first suck up all the dirt and rust, then fall straight down so that there is hardly any dust.

"By using Sponge-Jet we saved a lot of valuable time."

The wet environment requires that the application must be completed directly after blasting.

"We put submersible pumps into the tank and pumped out as much water as

possible before blasting. A problem was that some valves were not fully sealed and was leaking, causing water to enter the pump house."

"We did the blasting straight away and as soon as that was finished, we applied the type of composite which adheres to both damp and wet surfaces" Jan Hellstedt explains.

"We renovated the pumps with composite. The coating was finished by lunch time and the pumps were ready for use by 10am the day after.

IN TOTAL SIU renovated ten pumps; five of them were in such a bad condition that the sleeves had worn down to the shaft.

"We manufactured five new sleeves, renovated them and changed the bearings on two pumps.

We turned down the sleeves and increased the dimensions of the packing braid. As a result we had a pump that was maintenance free for five years, excluding the box packing of course", Jan Hellstedt explained.

This meant that the sewage plant got a construction which worked for the stipulated 2-3 years and it probably would have continued working considerably longer if required.

The renovation was carried out while the plant was running. There was no need to close or change the process during the blasting and renovating of the pumps (two or three at a time) and the life cycle was changed from zero to several healthy years.

Thus, two complete new processes were used; dust free blasting and composite coating in the form of a composite which is capable of getting adhesion and curing under water.





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New seals means big savings for Munksjö Paper

“You get one chance to show that it works and that’s it”, Jönköping said firmly. No one comes here to offer something which doesn’t work to 100 percent.”

But Benny was not at all worried; he knew that Depac would keep their promise. And he was right.

It was about sealing technology and leaking packing, which not only caused problems and irritations but also utilized resources in the form of materials and maintenance time.

IT STARTED in 2001 when Munksjö rebuilt their paper machine to attain a yearly capacity of 30.000 tons.

This is the hardest type of environment for machine equipment and packing as it contains a lot of aggressive chemicals and filling media.

“We had massive problems with braiding in the box packings inside the mixer in vessel 1 Börje Johansson said.

“We had to change them constantly.”

As the volume of the vessel contained as much as 130m³ there was a lot of leakage, so much that the pump under the vessel was submerged.

Furthermore, it was not just



Börje Johansson, Munksjö Paper Ltd.

pure water; the vessel contains pulp with up to 40 percent titanium oxide, which makes both sleeves and braiding wear.

SIU had already started working with Munksjö Paper Ltd

and Börje Johansson before the sealing discussions were tabled. Together we calculated that the maintenance material had to make around 20 packing repairs per year. Only the cost of the

packing alone was approximately € 3 150 on its own.

This job required eight man hours per packing. At an hourly cost of € 26 per person the job, including materials, cost € 7 370 per year.

Add this to the inconvenience of leakage and breakdown.

“We sat down and discussed whether we should replace the packing with mechanical seals instead. I said to Benny Palm that we should run a test, but you only get one chance.”

The solution was a Depac type 365 80 mm cost € 3 700. The leakage stopped immediately after the installation of the mechanical seal.

In the first year Munksjö Paper Ltd saved € 3 700. The seals have now been in place for three years and have so far saved the company € 11 100.

– “Now all the running around has stopped” Börje Johansson said.

And not just that; it was as though we have completely forgotten vessel 1.

It is not only mixers in vessel 1 that received mechanical seals.

The same installation was also carried out on centrifugal pumps where the media contained pulp, consisting of 40 percent titanium oxide. The temperature was 25°



The mixer before and after renovating and exchange to mechanical seals.

C and the pressure 5 Bar.

A similar problem was faced here; the packing needed to be changed approximately eight times a year.

This seal has been replaced by the Depac type 322 50 mm. So far around € 6 300 have been saved, releasing maintenance resources for more pleasant tasks than constantly rushing to seal leaking pumps.

The mixer before and after the renovation and exchange of mechanical seals.

SOME FURTHER SEALING jobs have been completed throughout the years. A condensate pump and a liquid pump have (received) been treated with mechanical seals instead of packing.

"We have changed seals and the renovation bearings in both pumps and corrected them with laser, Börje Johansson said.

"We are now planning to go further with this method and install many more mechanical seals as it is very important to eliminate leaks. It saves a lot of time and work".

Here are some examples where coal power and sewage plants have been able to save a lot of money by using Depac's sealing technology.

Customer	Paper Mill
Equipment	Mixer
Media	Pulp with 40% titanium oxide
Temperature	25°C
Pressure	1 Bar
Previous seal	Box packing
Re-sealing	20 times per year
Cost of sealing	€ 3 150 per unit per year
Labour cost	2 men x 4 hours x € 26 /hour= € 4 100
Total cost	€ 7 250
Solution	Depac type 365 80 mm – cost € 3 700
Saving in the first year	€ 3 550
This seal has now been installed for 3 years, saving up to now € 10 650	

Equipment	Centrifugal pump
Media	Pulp with 40% titanium oxide
Temperature	25°C
Pressure	5 Bar
Previous seal	Box packing
Re-sealing	8 times per year
Cost of sealing	€ 630 per year
Labour cost	2 men x 4 hours x € 26 / hour = € 1 660 per year
Total cost	€ 2 290
Solution	Depac type 322 50 mm – cost € 1 210
Saving in the first year	€ 1 080
This seal has now been installed for 3 years, saving up to now € 3 240	

Customer	Coal power plant
Equipment	Centrifugal pump
Media	Tall oil pitch
Temperature	80°C
Pressure	6 Bar
Previous seal	Chesterton 255
Seal change	Once per year
Seal cost	€ 2 630
Labour cost	2 men x 4h x € 26/ hour = € 208
Total cost	€ 2 838
Solution	Depac 322
Cost	€ 1 210
Life	More than three years
Savings	€ 7 300 in the first three years

Equipment	Seepex 52-12 BN
Media	Lime slurry
Original seal	Burgmann M7N-55-SC/SC/V1
Life	1-3 months
Solution	Depac cartridge seal 323-S-55-SC/SC-SC/SC/V1
Lifetime	12-18 months
Savings	More than 50% over previous sealing cost

