SEEPEX.
An Ingersoll Rand Business

INCREASED RELIABILITY FOR DANISH URBAN WASTEWATER

APPLICATION DETAILS

- Transport dewatered sludge to the digester
- Reliable pump solution for high pressure and corrosive media

KEY SPECIFICATIONS

- Reliable and secure pumping process for critical assets
- Faster, easier maintenance work with Smart Conveying Technology
- Double the lifetime of spare parts
- SEEPEX Pump monitor to secure the digester feeding

BACKGROUND

BIOFOS is Denmark's largest wastewater company. It is responsible for cleaning rainwater and wastewater for the municipalities, the operation of certain transportation pipelines and sludge incineration. BIOFOS plants treat the wastewater of 1.2 million residents in the metropolitan area of Copenhagen. The company runs three large wastewater treatment plants: Lynetten, Avedøre and Damhusåen. It utilizes the resources from wastewater to generate climate-friendly energy in the form of electricity, biogas and district heating for the public network. BIOFOS is a young company formed in 2013 and has been a SEEPEX customer since 2018.

Lynetten is one of three large wastewater treatment plants operated by BIOFOS.

TASK

The original pump was used for transporting primary sludge, a wastewater substance that has only been removed of debris and floating objects, to the next step of the wastewater process, digestion. In this step, sludge with a dry solid content of approximately 7-8% and a temperature of 5-25 °C has to be fed into the digester. Traditionally, these pumps have been installed with redundancy pumps to ensure reliability of the production. Feeding the digester is a critical process in wastewater treatment and down times have to be avoided or kept to a minimum time. The originally installed pump was known for breaking down every five to six months due to abrasive sludge transportation and high pressure. Frequently recurring down times, as well as high spare part costs, led to a situation that could no longer be tolerated by BIOFOS.

At this point, SEEPEX did not have a business relation with BIOFOS. As the problems with the existing pump portfolio became more and more apparent, the wastewater company was looking for an alternative supplier and contacted the specialist for pump technology to come up with a reliable pump solution that ensured less downtime. Top priority was for the wastewater treatment plant to operate much longer without unforeseen stops and breakdown of equipment.

COST SAVINGS

REDUCED SPARE PART COSTS

LESS MAINTENANCE COSTS DUE TO QUICK FAILURE DETECTION AND AVOIDANCE OF UNPLANNED MAINTENANCE WORK

SEEPEX PRODUCTS

- Smart Conveying Technology
  - BN 52-12S SCT (7.5 kW)
  - Pressure: 3.5 bar
  - Capacity: 20 m³/h
- SEEPEX Pump Monitor

SOLUTION

After evaluating the existing problem with the digester feeding, our experts offered a SEEPEX progressive cavity pump combined with a Pump Monitor for digital surveillance in order to ensure a reliable and secure process. Because of similar measurements, a BN 52-12S SCT pump was perfectly suited for substituting the competitor's pump. The pump was supplied with a 15 kW motor, so that the existing ABB Inverter could be reused. The pump came not only with the proven Smart Conveying Technology (SCT), but was also equipped with Smart Seal Housing, which enables a much faster cleaning of the drive sided sealing. BIOFOS installed the pump themselves, "It was a very simple task with the two fittings made in the workshop. We were easily able to mount the pump by ourselves, even though the installation dimensions differed slightly," Torsten Lauersen Vig, the Maintenance Manager explains. The design of SCT enables the rotor/stator sealing line to be adjusted to suit the application and compensate for wear, leading to more than double the lifetime of the rotor and stator.

Since then, its two-piece Smart Stator and quick release Smart Rotor – which leaves the joint in place – eliminated the need to remove the pipework. Smart Conveying Technology (SCT) means quick maintenance, significantly reduced life cycle costs and the shortest maintenance downtime. "The high productivity and the reduced downtime gives us more time to do other tasks and maintain other machines in the process and that makes our work more efficient," confirms the Maintenance Manager.

The results even exceeded the expectations: The pump has been running since August 2018, always 24/7 with more than 18,000 hours. In the first two years, no unforeseen breakdowns have been reported, the process runs in a stable manner and pumps reliably with 3.5 bar 20 m³/h of abrasive and corrosive media into the digester.

BN 52-12S SCT with Pump Monitor sensors at the Lynetten treatment plant.

ADDITIONAL DIGITAL SERVICES INCREASE COST SAVINGS

The installed SEEPEX Pump Monitor surveys the condition of the pump and, by means of its sensors, tracks data regarding capacity, pressure and temperature. This asset management enables the Maintenance Manager to always know the pump's performance and act preventively. With this measurement, SEEPEX has identified the need for adjusting the response time of the drive for smoother pump operation.

The SCT stator allows for retensioning several times, thereby ensuring a consistent throughput despite usual wear. This feature prolongs the rotor and stator life by up to 200%. "The adjustment of the stator halves is so much easier than exchanging parts on a conventional PC-pump," explains Jimmy Djarling Østerby, pump technician at the BIOFOS-site.

Compared to the old pump, in this period at least three stator changes with approximately 9 hours of maintenance work due to high wear could be avoided, which of course leads to fewer maintenance hours. "A 200% extended stator life is money right into the money box. It has a great economic significance," reports Lauersen. The condition-based monitoring clearly shows the capacity drop, when stator wear becomes imminent. This enables the Maintenance Manager to act early and reset the clamping. "In the long run, we even consider whether redundant pumps are strictly necessary, when installing a SCT-pump," said Lauersen, underlining the reliability of the smart technology.

BENEFITS

- Reliable and smooth pump operation with constant flow
- Reduction of spare part costs
- Predictive and easy maintenance

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