

PUMPS WITH WEEKEND VIBES

APPLICATION DETAILS

- Transporting biogas substrate, including recycled foodwaste, from buffer tanks to the fermentation facility
- Condition Monitoring for analyzing high tear and wear and optimizing the process

KEY SPECIFICATIONS

- Predictive maintenance
- Detection of process failure
- Process modification

BACKGROUND

A biogas plant situated 200 km outside of Stockholm, Sweden, was newly constructed in 2017 by Karlskoga Energi. The plant processes a biogas substrate consisting of food waste from households, restaurants and the Swedish food industry. The highly viscous substrate is mixed in silos, pumped to homogenization tanks and then conveyed to a fermenter. Three SEEPEX BN 35-12 pumps were installed in 2017 as part of this biogas production process.

TASK AND TARGET

The SEEPEX progressive cavity pumps smoothly conveyed the highly viscous material from the buffer tanks to the fermentation facility. The service life was as expected by SEEPEX experts. However, after a year in operation, the service life dropped and the customer invested in spare parts. Karlskoga Energi was eager to find out why the tear on wearing parts suddenly increased. SEEPEX worked closely with the customer to find the source of this sudden change.

Karlskoga Energi was of course interested not only in finding out why the wear of parts had increased, but mainly wanted to save on spare parts costs. Since most maintenance work took place at irregular intervals, another aim was to be able to identify well in advance when maintenance would be due.



Biogas plants successfully use progressive cavity pumps for the transport of various viscous substrates.

CONDITION MONITORED

COST SAVINGS

INCREASED LIFE OF SPARE PARTS

REDUCED MAINTENANCE COSTS

LOWER OPERATING COSTS

SEEPEX PRODUCTS

- Pump Monitor
- Three pumps: BN 35-12, BN 35-12S
- Pressure: 4 bar
- Conveying Capacity: approx. 10 m³/h

SOLUTION

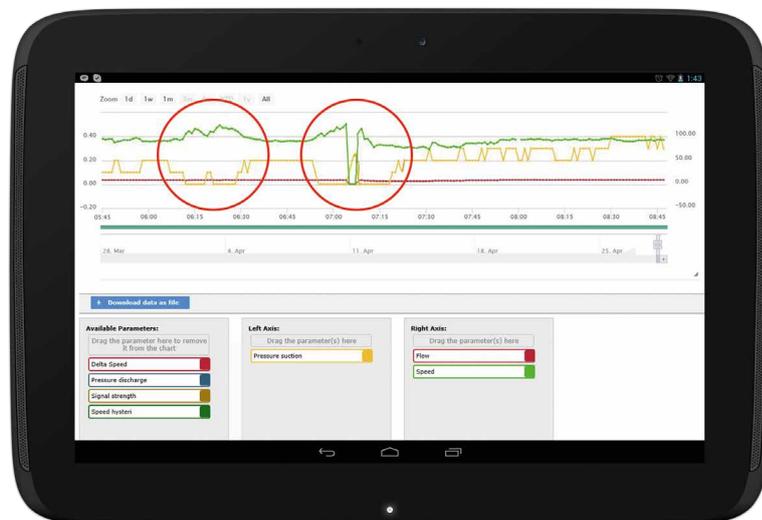
At SEEPEX's recommendation, Karlskoga Energi installed the SEEPEX Pump Monitor, a condition monitoring system. The Pump Monitor used pressure, speed and vibration sensors to record live operating data from all three pumps. An already existing flow meter from the customer was also integrated into the monitoring system.

After three months, SEEPEX experts analyzed the collected data and found a pattern in the pumps' performance. While the pumps ran smoothly on weekdays, the failure occurred on weekends, especially Sundays. On Sundays, there was a pressure drop on the suction side, along with a drop in measured flow. Through close partnership with Karlskoga, a potential for process optimization was found. Because the substrate buffer tanks were not receiving new food waste material on the weekend, the fill levels dropped compared to the constantly high levels during the working week. The solid parts of the highly viscous substrate then settled to the tank floor and were not properly mixed at the lower levels. The viscosity of the substrate became too high and led to cavitation in the pump.

With the help of SEEPEX's monitoring solution and expertise, Karlskoga was able to optimize their biogas production process. The customer changed the process accordingly and modified the substrate mixing on low levels inside the buffer tanks.

BENEFITS

- Reduced cost of ownership
- Better process performance
- Decreased downtimes



The graph shows recurring anomalies in the pressure, speed and flow.