



Digested Sludge Pumping – Higher Density With Lower Cost

Sludge Treatment Centre

Overview

The pumps at this sludge treatment site struggled with the wide diversity of DM (dry matter) content and variable solids in their sludges. Atlantic Pumps found the ideal pump for handling the wide range of sludge properties processed, enabling anything up to 12% TS. At the same time, operating costs have improved. The client's biore-sources lead is keen to replicate this success across more sites.

Problem

The sludge pump at the treatment plant wasn't living up to its promises.

This lobe pump was initially chosen for its compact design, stated efficiency (as new), low initial purchase price, and apparent effectiveness in moving sludge.

However, operating and asset maintenance costs proved vastly more expensive than predicted. Furthermore, it could not cope with the wide variety of slurry viscosities and bio-solids being imported into this site.

The wear rate of the incumbent pump required a lobe change every five or six weeks, and the higher viscosity sludges would either trip the system or cause sudden damage that brought the process to a halt, requiring emergency repair.

Furthermore, it was found that the quoted energy consumption was only true at first use, and the VFD inverter had to be sped up progressively to compensate for lobe wear.

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By working with Atlantic Pumps, the plant achieved reduced energy usage, reduced spares requirements and reduced maintenance costs, plus saw an increase in sludge density range.



Solution

Consulting with Atlantic Pumps, the specialists in solving abrasive challenges in fluid movement, revealed the potential of an alternative pump which had proved itself well in similar situations.

Looking at the wide viscosity range, the size and type of suspended solids, required flow volume, pH and temperature range, Atlantic Pumps recommended the LSM-100 as the best pump for this application.

Atlantic Pumps was pleased to put in an LSM-100 from their hire fleet, allowing the client to test the theoretical duty rate and capability on the actual application.

The LSM is an alternative positive displacement type pump with many advantages in challenging duties like this. It is more energy efficient, processes a wider range of viscosities and solid sizes, and vastly relieves maintenance time and budget.

LSM hose pump's flexibility and passage size reduce the risk of rag buildup, blockages, and impact or abrasive damage from bio-solids. Wear-life is greatly helped by the larger surface area of the rollers, and the pumps can safely run dry for intervals.

Results

The LSM pump delivered energy savings right from the start as its efficient action enabled the optimal flow rate at a reduced speed. Compared with the lobe pump, which experienced a rapid drop in effectiveness as it wore, the energy savings improved with time. This is due to the operating principle, design, and build of the LSM, as the lack of wear maintains the energy efficiency over a long operational period.

After 3 months of use, the new pump hasn't required any replacement parts, its energy efficiency remains stable, and many hours of downtime and manual interventions have been saved.

Not only is the pump saving money on existing sludge processing, it also increases the site's capability to treat a wider diversity of sludge viscosities. This has positive ramifications for the entire supply-chain, as satellite sites can potentially bring in more concentrated sludge, helping reduce tanker journeys and limitations to upstream treatment.

Following the successful trial, the client purchased the pump and is trialling more solutions from Atlantic Pumps in other challenges across their bioresources.



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