Newsletter for Allweiler business partners

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Save money with optimization consulting

The following report describes the situation at the Flerzheim cooperative sewage plant in Germany's Rhine-Ruhr region and demonstrates how optimization services can quickly save the client notable sums of money.

In the summer of 2008 an ALLWEILER pump technician provided consultation services for this plant and identified three opportunities for optimization. Although the problems were already widely known, the plant was not ready to make the necessary changes until ALLWEILER had analyzed the weak areas and provided a corresponding proposal. The result has been significant savings of money.

The following details the optimization steps and results:

A better way to handle raw sludge

The first step at the Flerzheim plant was to replace the belt drives of two SEP-series progressing cavity pumps with direct drives. Allweiler also selected the best possible speed so the pumps will always operate with optimized efficiency. In particular, capacity is no longer controlled by altering speed, but instead by altering operating times. In addition, using motors of Energy Efficiency Class 1 (EFF1) made it possible to reduce motor output from 5.5 to 4 kW. Wastewater engineer Wolfgang Schwarz is pleased with the results: "The additional cost of €140.00 to get the EFF1 motor paid for itself immediately. Maintenance costs are now also noticeably lower. Replacing parts on our old belt drive used to cost as much as buying the new motor."

The plant will also retire two centrifugal pumps that they had used for initial pumping of primary sludge. The new installation has shorter piping, eliminating the need for these pumps. The plant will also save the power and maintenance costs associated with these units.

Overall, these initial optimization steps have already significantly reduced energy and maintenance expenses.

Frequency-converter control for pumping excess sludge

In the second round of optimization, belt-driven units for pumping excess sludge will be replaced by frequency-converter control. The associated pump operates 24 hours per day; the material is directed to biological clarification stages depending on its sludge content.

Replacing the high-maintenance belt drive with an EFF1 motor (the speed of which is controlled by a frequency converter) is expected to reduce energy consumption by 10 to 15%, since the motor itself is more efficient. This change will also

For comparison: The new, significantly smaller EFF1 motor is shown in front of the old belt-drive motor.

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Allweiler's optimization recommendations made it possible to eliminate these two centrifugal pumps, saving the plant energy and maintenance costs.

improve reliability because it uses fewer mechanical parts that are subject to wear. “When we do have to replace something, we can do it much faster," according to Wolfgang Schwarz. As an additional benefit, the new drive is much quieter.

Pump modernization for redundant operation

The third phase of optimization involves the charge pumps for the chamber filter press. Before the consultation, a single ALLWEILER progressing cavity pump performed all the work. In the future, two pumps will perform the same task and provide the security of redundancy. But fortunately, this does not mean that the customer must purchase a new pump. Instead, an existing ALLWEILER pump that is no longer utilized will be refurbished and used for the new requirements. Frequency-converter control and the replacement of pumping elements are important aspects of this change.

Since both pumps are modularly constructed and many parts are exchangeable, the customer must keep only a small number of spare parts in stock. Thanks to the modular system, only a small number of parts are needed to rebuild and refurbish the pumps. Both ALLWEILER pumps have a discharge pressure of 12 to 15 bar and a capacity range of 31 to 77 m3/h.

The AE..N preliminary filling pump for charging the chamber filter press (right) will be refurbished to make it identical to the existing AE..H (left).

Original spare parts for additional savings

Moving forward, the Flerzheim plant will use only original parts directly from ALLWEILER. According to Wolfgang Schwarz, other parts vendors claim that their parts can stay in service for twice as long at only half the cost. In reality, the parts commonly last only one-quarter of an original part's service life. So clearly, the lower procurement cost actually masks higher expenses. Besides, according to Mr. Schwarz, his plant has a contract with ALLWEILER to obtain parts at a discount.

Summary:

Overall, the Flerzheim plant has benefitted greatly from ALLWEILER's expert consultation services. Without a doubt, the fact that Allweiler sent a competent technician with experience in both wastewater handling and pump engineering contributed to the success of the services.

Incidentally, the sewage plant performed the necessary conversions and installations with their own personnel. They even sought independent price quotations for the new pumps and controllers from multiple vendors. But since ALLWEILER submitted the best proposals, they placed the order with them.

About the plant:

The plant is designed to handle a population equivalent of approximately 50,000 residents. ■