

ITT PumpSmart® pump control system Dairy plant significantly reduces energy costs, saves millions of gallons of water

Over the past four years a large Midwestern dairy plant has been successfully optimizing many of its dozens of onsite pump applications, and, by strategically and creatively tapping into the capabilities of the ITT PumpSmart® pump control system, has been saving thousands of dollars in energy costs and over a million gallons of water every year.

Like a variable speed drive, the PumpSmart system works to control pumping speeds, but, according to the facility's maintenance manager, that is where any similarity ends. Variable speed drives are designed to control any motor, anywhere, and, he notes, can often offer only rough control of pumping systems in many applications. Unlike anything else he has seen on the market, the PumpSmart system, with its proprietary pump-specific programming, delivers highly specialized and precise performance that has given his facility unprecedented levels of control over their pumps, as well as new levels of protection against cavitation and other pump-specific threats.

"PumpSmart has given us the ability to drive variation out of our system," he said. "It lets us tightly control our pumps to run most efficiently, and keep them in control minute by minute."

First application saves thousands in energy costs

The plant's experience with the PumpSmart system began in 2008, when the 30hp pump that fed their boiler system was reaching the end of its useful life, and the maintenance manager and the plant team were considering how to proceed.

"Like most pumping applications, this application was oversized for the worst case scenario, and we knew that we didn't need anywhere near 30hp the vast majority of the time," he explained. "But, obviously, you can't just run a pump at half speed and get half flow, since pump performance is not linear. We wanted to find a way to gain control to make this process more efficient."

At the time, first inclination of the maintenance manager and his team was to try a succession of variable speed drives offered by major manufacturers.

"We found that variable speed drives tend to focus on generic applications, not the specific needs of pumping, and just didn't provide the necessary level of control for this application," he said. "They couldn't get our flow rate to the right parameters. They would tend to slow the pump down to a point where it would just stop working."

Fortunately, their local pump sales and service provider, Lee Mathews Company, was familiar with the capabilities of ITT PumpSmart and, with their support, the maintenance manager and his team decided to give it a try.

"One thing that we could see that PumpSmart did very well was tie two pumps together with one set point and optimize them. This allowed us to confidently replace the 30hp pump with two 15hp pumps," he explained. "These pumps are better sized for what we usually ran, and still stood ready for when our demand went up. PumpSmart controls them to work to the most efficient level needed as demands continually fluctuate."

The result, he notes, was not only a significant reduction in electricity needed to run the pumps, but also a decrease in the amount of natural gas needed to run the boiler, as the steadier performance of the pumps also led to a steadier and more energy efficient fuel consumption, with less need for the boiler to increase fire rate and then throttle back.

The ITT Impact

Energy savings estimated at \$20,000 per year with the addition of ITT PumpSmart—plus better, more consistent products.

Between the electricity savings and reduction in natural gas demand, he estimates energy savings of more than \$20,000 per year. But, he says, there have been many other important benefits as well, such as the PumpSmart system's ability to protect the pumps from dry-run and other dangerous process upset conditions.

"With PumpSmart, we are able to monitor the pump for overload and cavitation," he explained. "The system anticipates changes in flow demand or pressure and works to level them out. Standard variable speed drives just don't provide these pump protection features."

In addition, the PumpSmart system has also alleviated the need for idle spares, which can be a maintenance headache as well as an added expense in many facilities.

"Previously, we needed to maintain a 30hp spare, and, like many spares, it often takes up space in the corner and rarely gets to run," he said. "The PumpSmart concept for back-ups is completely different. We still have two pumps, but they are smaller and active and PumpSmart ramps them up together so they do an equal amount of work. And if one should fail, the other one would increase and take over. So we get the best of both worlds. PumpSmart keeps them alternating so that they both age at the same time, and we still get the assurance of having back-up or emergency capacity ready to go at all times."

Finally, he notes, there is a benefit that the thousands of lovers of the company's cheese and dairy products would especially appreciate.

"The reduced variation in steam pressure has enabled us to produce even better, more consistent products for our customers," he said.



ITP's PumpSmart system provides advanced pump control, protection, and optimization. In industrial applications, PumpSmart assists in reducing and preventing pump failures that result from process upsets or inadvertent operator error.

Opening the door to more applications, more savings

With the enormous success of this first application, the maintenance manager and his team began looking at their pumping applications in a new light, and began investigating new opportunities to put PumpSmart to work.

"PumpSmart gives you the ability to tightly control things that you couldn't really control before," he said. "There are a lot of features built into it that help you really understand your process. Once you use it, and you learn of its capabilities, you naturally want to go looking for all the different benefits it can help you achieve in the plant."

Working with ITP and distributor Lee Mathews Company, the maintenance manager and his plant team soon added several new PumpSmart applications.

"One great thing is that PumpSmart will work with any pump you have performance data on, no matter who the manufacturer is," he said.

For example, he notes, they split up the load on their chilled water cooling system pumps, using PumpSmart to drive variation out of the system and operate at more steady conditions, which helped the plant save thousands more in energy costs every year. In addition, on their hot water pumps, PumpSmart enabled them to more tightly control flow rate, reducing water sent to the pre-treatment plant by more than *one million* gallons every year, a waste reduction that this sustainability-minded company is especially proud of. And, he says, there have been many other successful applications and many more in the works.

"I don't think we've yet come close to exhausting all the energy saving and process improvement opportunities that are possible with PumpSmart," he said. "At a facility like ours, you're always pumping fluids around, and if you can do it more efficiently and consistently, it makes everything more successful all around."