The drive for efficiency - CG regulates Vitens' deep well pump with less energy

Vitens, the largest drinking water supplier in the Netherlands, has 5.4 million customers in the provinces of Friesland, Overijssel, Flevoland, Gelderland and Utrecht, and about 20 million additional customers in countries around the world. Their job is to ensure the purity of drinking water every day, around the clock, and they consistently surmount this challenge!

The drive for efficiency

Vitens' customers have come to take safe, affordable drinking water for granted, but providing clean water in an energy-efficient manner is no simple task. Drinking water usually travels significant distances and goes through many pumping, filtration, storage and other steps before it flows from a customer's tap. This not only has to work reliably and flawlessly, it also consumes a lot of energy.
With freshwater supplies under increasing strain in many parts of the world – even in rainy Holland – the amount of energy required for dependable supply is rising, and so are energy prices themselves.

Together, these factors are pushing water prices upward. To keep water affordable, Vitens must continually invest in energy efficiency.

In the Netherlands, as in many places, deep well pumps are used to draw freshwater up from underground sources. Pumping stations are located in small buildings and cabinets over the wells.

Tough operating conditions

In order to reduce the energy consumed with valves that regulate the flow of the deep well pumps, Vitens began looking for a more efficient solution.

It was not easy, because the equipment has to operate in quite tough environments, characterized by moisture, dirt and sand, big temperature variations, space limitations and other challenges. Any new solution needed to match these demands.

Vitens approached CG Drives, which has a reputation for industrial technology that can withstand challenging environments. Could CG offer a solution that would function well under such tough conditions? Moreover, could they provide a solution that would also enable Vitens to regulate its pumping stations for significantly less money? CG Drives & Automation proposed a pilot installation involving one pump at the Fledite Pumping Station in Zeewolde to find out.

Pumping stations located in small buildings and cabinets over the wells.

Pump

Pumping station

High pressure pump

A complete solution

A high-efficiency, durable, complete solution was installed for the pilot, enabling CG to successfully demonstrate that the job could be done using less energy, but with *at least* the same reliability and degree of control. Emotron variable frequency drives (AC drives) were used, in combination with an all-pole filter for protection of the special deep well pump motors. Frequency drives (AC drives) are connected to the pumps, regulating their speed, ensuring the needed flow of water. Since the earlier use of motor valves had accounted for much of Vitens' energy loss, the switch to variable frequency drives (AC drives) reduced energy consumption considerably.

Emotron variable frequency drives (AC drives) in combination with an all-pole filter.

Benefits, and return on investment

The main benefit achieved by the Fledite installation was in energy savings. With its full complement of 13 CG-regulated pumps operating, at 7 million cubic meters of annual pumping volume, about 250,000 kWh per year are being saved. At a current electric rate of 12 eurocents per kWh, this gives annual savings of € 30,000.

The equipment and installation costs totally about € 85,000, which means that the installation at Fledite will pay for itself in less than 3 years at present energy prices and water pumping rates. If either rate or volumes increase, it will pay back even faster.

Not only are the numbers great, an additional benefit is the increase in reliability that the CG solution contributes to the drinking water supply. Add to this, the increased uptime at the well heads and pumping stations, saved working hours, longer equipment lifetimes and fewer agerial headaches, and it is clear that Viten has made very sound investment indeed!

In brief

Customer: The Vitens water supply company's Fledite Pumping Station in Zeewolde, Netherlands

Challenge: To decrease the energy consumption involved in regulating valves in deep well pumping systems while increasing equipment reliability and durability

Solution: The Emotron frequency drives (AC drives) for pump regulation, along with associated control equipment, cabinet, and pump filters

Benefits

- Assurance of a safe, dependable drinking water supply for Vitens' customers
- Lower energy costs
- Rapid investment payback
- Greater equipment durability and reliability
- Longer equipment life
- Reduced labour and management costs

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