

Case | Shaoguan, China

Pump upgrade for growing city brings efficiency – Plus surprise benefits



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Possibility in every drop



The Qujiang Water Supply Management company could no longer meet the needs of urban development in Shaoguan. It is doubling its capacity and has renovated two of its pumping stations to cope.

The situation

In a mountainous region of Qujiang, China, where the water supply has been traditionally helped by gravity's flow, urbanization was offering a new challenge.

“When this waterworks was built in 1990, we focused on energy conservation and high efficiency,” says Liu Zhiwei, Chief of Technology and Equipment, Qujiang Water Supply Management, Shaoguan, in Guangdong Province. “But China has had a lot of urban development in recent years. New buildings are constantly being built here. And with the improvement of living standards, household water consumption has also increased.” The plant is located on a hillside, 60 metres above town, so treated water can flow down to the city centre. “Our old model of using gravitational flow no longer meets the needs of urban development,” says Liu Zhiwei. “We can't meet the domestic water demand.” The plant is thus building a 60,000-square-metre expansion

of the waterworks that will nearly double its capacity. In addition, he says, “in order to actively respond to the national call for energy saving and emission reduction and gradually phase out outdated and high-energy-consuming equipment,” the Qujiang Water Supply Management office invited the engineers and technicians of Grundfos (Shanghai) Pumps Company Ltd. to carry out a systematic “Pump Audit” for its booster pump stations.

The plant settled on renovating its Shiliuye and Shaoye pumping stations.

Liu Zhiwei says the company's focus was on both efficiency. It was not until after the renovation that his team realised the newer pumps would bring another benefit: noise reduction. The Grundfos Pump Audit revealed that especially Shiliuye pump room had a design problem, where the hydraulic head was too high. The motors were in overload status much of



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the time, wasting energy and placing the system operation in danger of breakdown.

“And the pumps in the Shaoye station had been running for 20 years,” he says. “They had problems in regard to safety and reliability. The bearings had to be replaced regularly. The control cabinet used an old-style step-down transformer to start the pumps. And there were noise problems in both stations.” In fact, he adds, the noise in the pump rooms had been measured at 97-112 decibels (dB). According to the World Health Organization, the average human pain threshold for noise lies at 100 dB, and eight hours of exposure to such noise levels can cause serious damage. Part of the noise problem was attributed to vertical installation of the previous pumps, leading to high vibration.

“We wanted to improve the environment for our workers and save on energy,” says Liu Zhiwei.



“Efficient and quiet pumps are good for our work environment.”

Liu Zhiwei, Chief of Technology and Equipment
Qujiang Water Supply Management

What started as a project to improve pump efficiency brought other benefits – such as happier workers from quieter pumps, as well as advantages to the surrounding community like stable water supply and high-quality life, Liu Zhiwei, Chief of Technology and Equipment at the Qujiang water company, at the Shaoye Booster Pump Station in Shaoguan, China.



Zhong Jinshou, Head of Department at Qujiang District Water Supply Management, says he enjoys the stability and quieter operation of the new Grundfos pumps.

The solution and outcome

The Qujiang water company installed two LS 75 kW horizontal split case pumps from Grundfos at each pumping station. After one year at Shiliuye and Shaoye, the new pumps’ energysaving rate was estimated at 33% and 17% respectively. “The saved power consumption is meeting our estimations in the energy-saving scheme,” says Liu Zhiwei, adding the savings are due to the pumps’ high efficiency and meeting the exact demand for water supply. “From the beginning of the renovation process, our focus was on becoming energy-efficient,” he says. “But when we started using the Grundfos pumps, we found that they were also quiet. Our workers on site were very happy with this.”

Today, when the pumps are running, the noise level is at 85 dB, the safe level for prolonged noise.

“Efficient and quiet pumps are good for our work environment,” he says. “Also, because of new stable pumps, we have increased our water supply guarantee rate. This is a big help for our citizens.” Liu Zhiwei says that the Grundfos Pump Audit not only helped him to broaden his horizon with regards to technology. “Throughout this project, I have learned to not only pursue economic benefits. I have also learned about humanistic concerns and work environment. In my future management work, I also need to consider these aspects.”

Grundfos supplied:

Grundfos performed a Pump Audit in 2016 at the Qujiang water company’s booster pumping stations, revealing the benefits for installing LS horizontal split-case pumps for better efficiency. They were quieter, too.

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Grundfos Holding A/S
Poul Due Jensens Vej 7
DK-8850 Bjerringbro
Tel: +45 87 50 14 00
www.grundfos.com

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