CASE STUDY 9/2019

HST™ turbocompressors replace air-foil bearing machines in Dutch wastewater treatment plant

RWZI Haarlo is a municipal wastewater treatment plant of the Water Board Rijn en Ijssel in the Netherlands. It takes care of the wastewater from the municipality of Berkelland in the eastern part of the country, close to the German border. Berkelland has more than 40’000 inhabitants. Lately, the capacity of the treatment plant was increased to 50’000 people equivalent (PE). Some industrial factories are connected to the treatment plant as well.

“After good experiences at RWZI Zutphen we chose Sulzer’s HST turbocompressors once again. These machines run without problems, are quiet and offer high efficiency. The controls are flawless, and very little maintenance is required.”

Paul Kersten, responsible engineer at RWZI Haarlo

The challenge

Since 2011, RWZI Haarlo had been equipped with air-foil bearing turbocompressors. These machines, only eight years old, caused serious reliability issues to the treatment plant. Of the original three units, only two were in use. The third one was irreparably damaged. The two remaining units turned out to be very unreliable. The breakdown of a second turbocompressor would have meant a shortage of oxygen in the aeration basins.

In addition, the water board wanted to install two flow meters, one to each aeration basin. To do this in a correct way, the piping needed to be adjusted.

The communication between the old air-foil bearing turbocompressors and the SCADA system took place through a Modbus connection. The Modbus had to be kept, but the system also needed to be prepared for a simple and quick switch-over to the planned transition to Profibus in two years.

The solution

After a thorough comparison of different alternatives on the market, the company decided to replace the air-foil bearing turbocompressors by three Sulzer HST™ 2500 turbocompressors equipped with magnetic bearings. These are controlled by a Sulzer MCU 300 Modular Control Unit. The MCU is connected to a pressure sensor and ensures efficient control of the turbocompressors.

Sulzer also designed the new pipework and the layout of the blower room. A good collaboration between the parties secured a very good result. After commissioning, Sulzer monitored the machines remotely for a few weeks.

Customer benefits

- Increased reliability
- Lower energy consumption
- Flow meters installed to measure flow to both tanks
- Very low noise level
- Low maintenance costs

The MCU is connected to a pressure sensor and ensures efficient control of the turbocompressors.

The Sulzer difference

- Clever aeration and mixing solutions ensure efficient treatment at low power consumption.
- The HST turbocompressor offers reliable operation and top efficiency at the lowest cost while minimizing the environmental impact.
- In the high speed turbo compressor market, Sulzer is the leader in magnetic bearing technology.

Product information

Sulzer has more than 25 years of experience of high-speed magnetic bearing turbocompressors. The air flow is controlled by an integrated frequency converter.

The delivery included three HST™ 2500 turbocompressors.

Airflow	900 – 4‘000 Nm^3/h
Pressure rise	30 - 85 kPa
Input power	69 - 90 kW
Max. current	107 - 140 A
Noise level	< 69 dBA

Sulzer MCU 300 Modular Control Unit

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