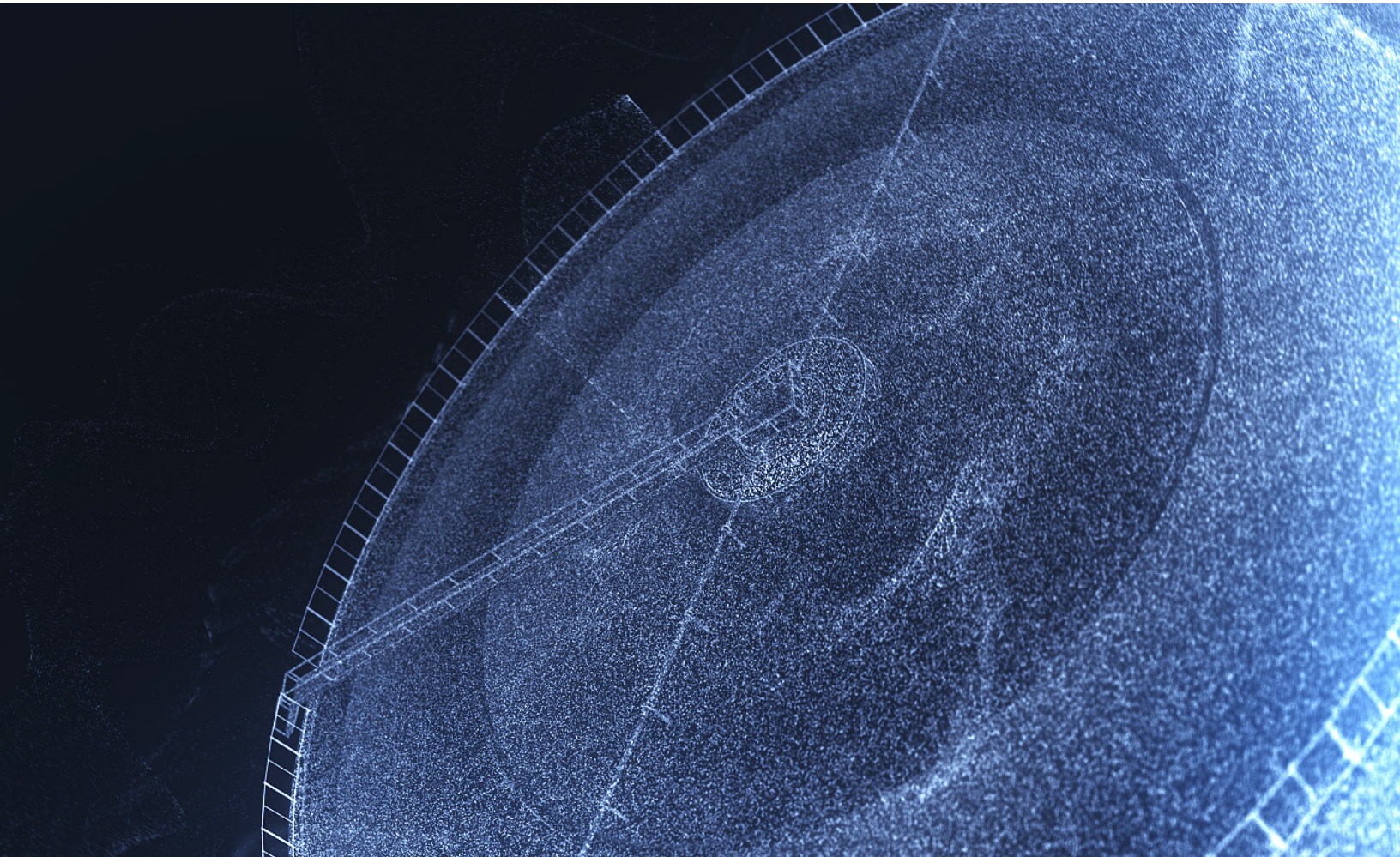
SULZER

CASE STUDY

Upgrade to HST™ turbocompressor yields energy and treatment improvements

Replacing a critical positive displacement blower with a Sulzer HST turbocompressor results in significant efficiencies and a facility upgrade.



“Sulzer’s customer service has been great. They ensure that the HST not only fits our needs, but that it works the way we want it to work.”

Justin Phelps, Wastewater Superintendent - Chehalis Regional Water Reclamation Facility

Built in 2007, the Chehalis Regional Water Reclamation Facility (CRWRF) processes wastewater for the cities of Chehalis and Napavine and Lewis County, Washington. On average, the facility treats 1.3 million gallons per day (MGD) for a population of roughly 12,000, and at its peak, can produce 3.5 MGD of reclaimed water.

In mid-2023, one of CRWRF’s original 200-horsepower positive displacement blowers experienced a critical failure, jeopardizing the facility’s ability to meet process air demands for biological treatment. With the rainy season just a few months away, CRWRF needed to find a replacement quickly to avoid operational disruption.

Seizing an opportunity

After learning that a plug-and-play replacement would come with long lead times and trigger a financial threshold with the facility’s procurement department, Wastewater Superintendent Justin Phelps decided to explore upgrade opportunities. He contacted Ryan Brusca, Director of Business Development at Reiner Pump Systems, to explore options that would meet CRWRF’s design and performance requirements.

The Sulzer HST™ turbocompressor quickly caught Phelps’ attention. Known for its quality, reliability, and energy-efficient operations, the HST matched all required specifications, and there was an unused 150-horsepower unit sitting on a shelf in a city just 250 miles away. The nearby city had purchased a Sulzer blower a few years ago. However, the treatment facility increased its capacity before installation, which meant the blower was instantly undersized. The system was placed on a shelf — giving CRWRF a perfect opportunity to cost-effectively acquire a highly efficient blower in less than 30 weeks.

CRWRF coordinated with the municipality selling the new blower and received it in just eight weeks. Once the blower arrived on-site, CRWRF operations staff worked with Reiner Pump Systems and Sulzer’s startup and implementation team to install and commission the HST.

Averting a potential crisis

CRWRF has one blower for each sequencing batch reactor tank. The positive displacement blower failure meant that one tank was completely inoperable. While only two tanks are used during the summer, the facility needs every tank online for wet-weather operation. Waiting for the in-kind replacement would have forced the facility to operate without one of its reactor zones — a costly, stressful, and labor-intensive effort that could lead to treatment issues.

Fortunately, CRWRF never had to operate in crisis mode. Upgrading to the HST cut lead time by 73%, and the coordinated effort among the facility, Reiner Pump Systems, and Sulzer ensured the new blower was operational in October 2023 — the critical deadline for restoring full blower functionality.

Upgrading the technology yields greater efficiencies

Unlike the positive displacement blowers, the HST was designed for efficiency. Its proven magnetic bearing technology ensures reliable, efficient, and quiet operation, and the built-in variable frequency drive (VFD) gives CRWRF the control they need to optimize performance. “Instead of ramping the blower up and drawing it down, it can operate at a set percentage for a specific time interval,” explained Phelps. “Providing this consistent, reliable airflow creates a much more stable environment for the microorganisms. It’s the best way to treat the wastewater to deliver an effluent product that’s good for the river and reclamation.”

More efficient operation has also led to significant energy savings. After the HST was commissioned, Phelps compared power consumption to the facility’s 2022 energy audit results. With its current operational setup, CRWRF saves an estimated 132,000 kWh or approximately $6,000 annually.

Additionally, these efficiency gains enabled CRWRF to qualify for an energy rebate from Washington’s power utility that reimbursed more than 40% of the project’s total costs.

The facility’s operators also appreciate the HST for enabling a more consistent process and reducing maintenance requirements. Except for filter replacements, the HST operates virtually maintenance-free. “Less preventive maintenance and fewer work orders make it easier for operators to do their job,” stated Phelps.

Building on the project’s success

The ROI of the HST has led to a plan to upgrade the entire plant, which promises even greater efficiencies and energy savings. CRWRF intends to replace a second positive displacement blower with an HST turbocompressor and re-pipe the blowers to work with any tank. This will create redundancy and enable the blowers to run everything in the plant. Once the new piping is in place, Phelps estimates they will reduce yearly energy costs by more than $14,500. The upgrades are expected to go online in 2026.

“This project stands as a model of adaptive planning, interagency cooperation, and responsive vendor support,” explained Phelps. “The confidence built has had ripple effects within the plant and with our city council. Everyone sees that we’re making changes that enable us to be preventive, rather than reactive. We’re looking at the future and making changes that will deliver energy savings and support the city as it grows.”

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