NETZSCH Lobe Pumps Reduce Maintenance and Downtime for Wastewater Treatment Plant

At the main wastewater treatment plant serving Wilmington Delaware, plant operators turned to NETZSCH TORNADO® T2 positive displacement rotary lobe pumps to replace existing pumps in two sludge applications, leading to a decrease in maintenance and downtime.

Veolia Water North America is a leading provider of water and wastewater services for municipalities, government entities, business and industry. In 1985, Veolia Water assumed the responsibility for operating, maintaining, and managing the Wilmington, Delaware solids processing facilities. In 1998, the company was awarded a new 20-year, $224 million contract to manage the entire wastewater treatment process for the city and outlying served areas. That project included a 134-MGD high-rate activated sludge plant, three pump stations, industrial pretreatment program, industrial leachate and 11,000 dry-tons-per-day sludge disposal. Like many older industrial cities, Wilmington has a "combined" sewer system, meaning that both sewage and storm water share the same pipes as they flow to the Wilmington Wastewater Treatment Facility and eventually back into the Delaware River.

NETZSCH has recently provided Veolia with new pumps that have dramatically lowered maintenance and downtime in two different sludge handling applications including transporting thickened sludge and digester recirculation. Plant operators noted that prior to installing the NETZSCH rotary lobe pumps in both of these applications, the annual pumps maintenance budget was $250K. Aleksey Reznik, the plant general manager for Veolia North America noted that this maintenance cost "was insane". He went on to say that the operational goal was not to continually change pumps.

NETZSCH TORNADO® T2 Rotary Lobe Pump seen in operations in sludge transfer line.

A Low Maintenance Solution for a Problematic Thickened Sludge Line

For the thickened sludge transport application, Reznik said, "We had read a good report on the NETZSCH lobe pump and did a 90-day test on our worst application, which was a feed line to our digesters with 3 to 4% solids at 60 psi pressure." The first NETZSCH TORNADO® T2 pump replaced a competitor's progressing cavity pump with an inferior design. The plant operators also replaced a second progressing cavity pump from the same manufacturer but with a traditionally designed rotary lobe pump from a NETZSCH competitor. However, that rotary lobe pump was not able to handle this heavy-duty application and was finally also replaced by a NETZSCH TORNADO® T2 rotary lobe pump with a full-service-in-place (FSIP) design to minimize downtime. To date, the two pumps are working 24/7 in that application, providing a low maintenance solution in this critical plant operation.

According to plant operators, the two earlier progressing cavity pumps had pressure problems due to their inferior design with a very high angularity as a result of a short coupling rod and only grease lubricated joints. Reznik said, "One pump had a small dogbone, and it would snap all the time. I would say that the longest running pumps we had would last about one year. We even had one pump that would go down every three months. We installed the four-inch NETZSCH TORNADO® T2 pump and it has been running continuously for two years.

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A Veolia maintenance engineer checking the NETZSCH TORNADO® T2 Rotary Lobe Pump during routine maintenance. Note the easy access to rotors from front of the pump.

Pump Data for 4-inch* pump	
Pump type:	TORNADO® RLP Model 06/70
Capacity:	50 to 200 gpm / 11 to 45 m^3/h
Pressure:	40 psi / 3 bar
Medium:	Thickened Sludge 3 - 4%
Temperature:	70° F / 20° C
Viscosity:	1,000 cps
Speed:	150 to 450 rpm

Pump Data for 6-inch** pump	
Pump type:	TORNADO® RLP Model 06/140
Capacity:	300 gpm / 70 m^3/ hr
Pressure:	14 psi / 1 bar
Medium:	Thickened Sludge 3 - 4%
Temperature:	70° F / 20° C
Viscosity:	1,000 cps
Speed:	300 rpm

We've replaced two seals in that time, but with the easy access through the faceplate, that was a very simple operation."

Digester Circulation Line Now Running Almost Maintenance Free

According to Frank DiPeitrapaul, a maintenance engineer at the treatment plant, some of the sludge digesters have always had problems with gas bounding. DiPeitrapaul said, "Before we installed the NETZSCH rotary lobe pumps, we had been using recessed impeller centrifugal pumps for years. There is a very long suction line, gas comes through and the pumps continuously lost prime. When the pump lost prime, we had to back flush the line by pumping water in, which is something you don't want to do in this sludge application." DiPeitrapaul continued, "Plus, we have a small staff and this issue was creating havoc with our maintenance schedule." He notes that the NETZSCH pumps have been running almost six months in the sludge circulation application without any downtime and have completely solved the air-bounding problem.

DiPeitrapaul said, "Not only that, since the pump is belt-driven, there is no oil. You don't have to worry about putting in the wrong oil or running out of oil. There is a small container that puts a small amount of oil on the seal – but that's it." "We have two NETZSCH pumps now working in this process. The first is a four-inch* rotary lobe pump. Also, since our digesters are remotely controlled by data, they open and close automatically and there is some back-pressure as you go down the line. With this higher pressure we've installed a NETZSCH six-inch** pump."

He goes on to say that the plant maintenance staff regularly checks the TORNADO® T2 pumps to see if the lobes need to be changed, but that they haven't had to since the lobes don't show enough wear. "Our guys, in terms of maintenance, they love the NETZSCH pumps," said DiPeitrapaul. "The design is very simple and it takes about 15 minutes to check them over. Even when we had to repair the seals, it was easy because, due to the design, you don't have to pull the pumps out. We also like the NETZSCH pumps because of the small footprint."

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NETZSCH customers rely on our rigorous standards in design, engineering and manufacturing to deliver products with absolute functional reliability and exceptional quality. NETZSCH service, like NETZSCH quality, is geared to surpass our customers' expectations. For more information on this customer application and NETZSCH products and services:

Phone: 610-363-8010
E-mail: npa@netzsch.com
www.netzsch.com

