

Temporary bypass solution maintains treatment operations

How a flexible bypass pumping system overcame site constraints to safeguard aeration and effluent quality.



Temporary bypass pumping system maintaining aeration flows during screw pump maintenance.

The challenge

A wastewater treatment works required critical maintenance on its screw pumps, the equipment responsible for lifting incoming flows into the aeration tanks and forming a vital link in the biological treatment process. Taking the screw pumps offline for maintenance meant risking a disruption to the inflow supply, which could compromise the aeration process and the quality of the final effluent.

The challenge was compounded by significant site constraints. Restricted space and limited access around the installation point ruled out many conventional pumping options, while the solution still needed to deliver the high flow rates required to keep the treatment process running. Critically, the bypass had to do more than simply move water, it needed to replicate the balanced distribution the screw pumps provided across multiple aeration tanks, so that no single tank was

starved or overloaded. Power resilience was also a key consideration, as any interruption to the temporary system would have an immediate impact on treatment performance.

The solution

A temporary bypass pumping solution was designed and installed to take over the function of the screw pumps for the duration of the maintenance. Slimline Flygt 3171 pump units were selected specifically to overcome the site's space and access limitations. Each pump is capable of delivering in excess of 70 litres per second, providing a compact yet high-capacity solution that met the required hydraulic performance within the restricted installation area. Due to the limited access, an external crane was used to lift and lower the pumps into position.

To replicate the balanced distribution of the screw pumps, the system was configured with a common

discharge line running from the pump installation, which then branched off to supply multiple aeration tanks. Flow distribution was achieved using a series of Y-piece connections and gate valves at each branch. This arrangement allowed operators to regulate and balance delivery across all tanks, valves closer to the pump discharge were throttled accordingly, while those further downstream remained more open, ensuring even flow distribution and optimal process performance throughout the system. The flexibility of the pipework configuration also allowed adjustments to be made in response to changing operational requirements.

Power resilience was built in through a duty and standby generator setup, complete with automatic changeover functionality in the event of primary generator failure. Fuel levels were remotely monitored via telemetry, and all pumps and control panels were integrated into the Xylem Vue Secure Connect (formerly known as Avensor) platform, providing 24/7 remote access to live operational data and enabling proactive monitoring and rapid response to any changes in system performance.

Results

The bypass arrangement effectively replicated the function of the existing screw pumps, maintaining consistent inflow to the aeration process and preventing any disruption to biological treatment throughout the maintenance period. Balanced distribution across the aeration tanks was preserved, safeguarding treatment performance and final effluent quality.

The duty/standby generator configuration with automatic changeover ensured continuous operation under all conditions, protecting the treatment process against power interruptions. Remote monitoring via telemetry and the Xylem Vue Secure Connect platform gave operators round-the-clock visibility of the system, allowing proactive management and a rapid response to any variations in performance. The combination of a compact, high-capacity pumping solution, flexible flow-control pipework, and resilient power provision meant the critical maintenance could be completed without any compromise to the works' treatment operations.



Top: Flygt bypass pumps deployed as part of a temporary pumping solution.

Bottom: Flygt 3171 pump units were selected specifically to overcome the site's space and access limitations.

Client

Water Utility

Xylem's role

To deliver a fully integrated, remotely managed bypass solution.