Managing complex temporary bypass flows

Delivering a resilient temporary pumping solution to maintain uninterrupted wastewater services during critical network infrastructure works.

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The challenge

A critical section of a live wastewater network required temporary bypass pumping to enable essential works to be completed while maintaining uninterrupted service.

The project presented several challenges:

- Managing highly variable flows, including potential storm events generating several hundred litres per second.
- Intercepting and transferring flows from multiple locations across the network.
- Installing equipment through restricted access points with limited working space.
- Maintaining operational resilience throughout the project, including protection against power outages.
- Ensuring continuous visibility of system performance across a complex temporary installation.

The bypass system needed to accommodate peak design flows of up to 500 litres per second at each active manhole location, providing sufficient capacity and resilience to manage extreme weather events and unexpected flow increases.

The solution

Xylem designed and delivered a bespoke temporary bypass pumping solution capable of managing distributed storm flows while maintaining full system operation.

Due to restricted access arrangements, Dri-Prime pump units mounted on compact skids were selected, enabling installation through limited openings without compromising pumping capacity. The compact design allowed deployment in confined spaces while still delivering the performance required to handle high-volume flows.

Each pump installation was controlled by temporary Variable Speed Drive (VSD) panels, automatically adjusting pump performance to match changing flow conditions. This ensured efficient operation during normal network conditions while providing the flexibility to respond rapidly during storm events.

The primary pumping arrangement consisted of:

- Two high-capacity pumps discharging into a common 500 mm pipeline.
- More than 450 metres of temporary discharge pipework.
- Flow transfer over distances exceeding 300 metres.
- A temporary screening system to remove ragging and debris before flows entered downstream equipment.
- Additional pump sets integrated into the common discharge system to manage inflows from multiple interception points.

To maximise resilience, the entire bypass installation operated from a duty and standby generator arrangement with automatic changeover. In the event of a primary power failure, the standby generator automatically assumed the load, ensuring uninterrupted operation.

System visibility was maintained through Xylem Vue Secure Connect (previously known as Avensor) telemetry, providing 24/7 remote monitoring of pumps, control panels and generator fuel levels. This enabled real-time performance tracking and rapid response capability throughout the project.

The results

The temporary bypass solution successfully maintained continuous operation of the live wastewater network throughout the works programme.

- Managed variable flows from multiple interception points
- Provided capacity for peak design flows of up to 500 litres per second at each active manhole location.
- Enabled installation in restricted access locations through the use of compact skid-mounted Dri-Prime pumps.
- Removed ragging and debris via a temporary screening unit prior to discharge.
- Maintained uninterrupted operation through duty/standby generators with automatic changeover capability.
- Delivered continuous remote monitoring of pumps, control panels and generator fuel levels via Xylem Vue Secure Connect.
- Provided resilience to accommodate extreme flow conditions without compromising system performance.

Top: 500 mm discharge pipeline providing high-capacity flow transfer across the temporary bypass network.

Bottom: Compact Dri-Prime pump installation designed for restricted access environments and continuous operation.

Client
Water Utility

Xylem's role
Design, supply, installation and monitoring of a temporary bypass pumping solution.

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