

Wastewater storage basin Dätt nau, City of Winterthur (CH))

ALLinONE and pneumatic flow control TF-PNA prevent sewerage network overload

The sewerage network of the city of Winterthur consists of over 600 km of private and public sewerage. It collects wastewater from Winterthur and 11 surrounding municipalities and directs it to the ARA Hard.

During heavy rainfall, the sewerage system below the Dätt nau stormwater basin was overloaded even though the Dätt nau stormwater basin above was almost never filled. The basin

was not yet equipped with state-of-the-art technology and did not have an intact measuring system. It was also not connected to the DCS system of the city of Winterthur. Therefore, equipment was required to improve monitoring, activating the storage volume of the Dätt nau stormwater basin by means of throttling to relieve the hydraulic pressure on the underlying sewerage system and also on the sewage treatment plant.

Requirements:

- Reliable discharge measurement and control, as well as measurement technology in the basin
- ATEX-compliant design
- New power connection and new control cabin
- Interface to the customer's DCS
- Improved working conditions and occupational safety
- Lighting in the basin
- Larger and safer entry into the basin





Figure 1: In dry weather the water flows zigzagging between the 'Toblerone structures'. In rainy weather and when the basin is filled, the water can be discharged in the discharge channel, visible at the left end of the pool. Right: Curve directly after the outlet of the Dätttau rainwater basin. After the curve, the pipe was not accessible, which is why a partition was newly built inside the basin to integrate the pneumatic discharge control.

In order to activate the basin volume, a partially filled flow measurement (TF) with a pneumatic flow controller (PNA) was installed. In the case of the Dätttau stormwater basin, the pipe on the outlet side of the tank was not accessible. Therefore, it was decided to integrate a measuring and throttle shaft into the basin before the basin outlet (Figure 2). The volume of the stormwater tank was thus reduced by a few cubic metres. In contrast, the remaining volume is now fully utilised. The pneumatic discharge control throttles the discharge volume as soon as it exceeds the set value.

The setpoint value can be dynamically set by an external system (in this case the DCS).

Thanks to the ALLinONE solution, the discharge volume measurements, lighting control, heating control and, as a provision, exhaust air control could be implemented with only one control unit together with the flow control. Thanks to the standardised interface, the control system could be easily integrated into the existing DCS system. The data recording, alarming and the preset values are thus controlled by a higher-level control system.



Figure 2 left: A shaft was built on the discharge side so that a pneumatic discharge controller could be used. In case of rain, the flow is reduced to use the volume of the basin. Right: The entrance to the throttle shaft, which is spacious and safe after the reconstruction.



Figure 3: Cabin with STEBATEC control system, compressor and heating. The data connection via fibre optic cable to the DCS can be seen at the top left.