

SIWA Sewer

Centralized sewer network control system to prevent flooding as a contribution to sustainable water protection

The challenge

As a result of climate change, heavy rainfall events will occur more frequently and more severely. Sewage systems must be designed to cope with these short-term volumes of water in order to prevent the overflow of untreated sewage into surface waters. At the same time, the amount of municipal waste water is being reduced through the environmentally conscious, water-saving behavior of the population.

Until now, waste water flows in sewer networks have been controlled on site, chiefly on the basis of locally available information. Although this can be realized quickly with relatively little capital investment, it is reaching its limits regarding the prevention of overflows to protect surface water.

Through targeted, centralized sewer network control, the storage volume of the components contained in the network can be used to reduce or avoid discharges in the sewer network and also to stabilize the inflow to the sewage treatment plant. Based on live measurements of precipitation, water levels and discharges, it is possible to control valves, pumps and weirs in such a way as to ensure optimum operation of the sewer network and the sewage treatment plant.

The solution

- SIWA Sewer is a powerful and innovative sewer network control application that calculates the need for control interventions in drainage systems using optimization algorithms. In this way SIWA Sewer ensures optimum utilization of the sewer network, thereby preventing waste water from being discharged into natural waters.
- SIWA Sewer optimizes water treatment performance by stabilizing the inflow to the treatment plant so that the operator can run the facility more efficiently.

Siemens Industry Suite - Smart apps for the water and waste water industry

The applications and digital services for the water industry from the Siemens Industry Suite provide greater transparency and thus identify the potential for greater efficiency and savings to ensure a high level of supply security. Using the Siemens Water (SIWA) applications specially developed for the water and waste water industry, you as an operator can, among other things, optimize energy efficiency, avoid water losses, prevent flooding and take preventive maintenance measures.

SIWA Sewer

- SIWA Sewer supports operating personnel and lightens their workload in both normal and emergency operation.
- In addition, plant operators can save the cost of investing in additional storage structures by using SIWA Sewer to make optimum use of existing storage volumes in the waste water network.

Customized configuration is extremely simple. Thanks to a special component library, SIWA Sewer can easily be adapted to any sewer network and takes into account all key technological and operational restrictions relevant to the creation of optimal plant schedules.

Combined with a process connection via an OPC UA interface, the system becomes a powerful online system that can also be connected relatively easily to an existing automation solution as a fully automated assistance system. The SIWA Sewer user interface is coordinated with the SIMATIC WinCC / PCS7 process control system, but can also be connected to existing control and automation systems.

With the objective of preventing the discharge of untreated wastewater and implementing a steady waste water inflow to the treatment plant, SIWA Sewer uses a mathematical network model to create a central and optimized control strategy at regular intervals. The results of this optimization are setpoints for all control elements within a wastewater network, i.e. weirs, pumps and valves, based on current measurements such as precipitation, water level and outflow. In this context, sewage network and sewage treatment structures such as storm water overflow tanks, storage sewers, throttle valves, sewers and sewage treatment plants are all taken into consideration.

By means of open or closed-loop control using information covering all structures, SIWA Sewer enables the user to react to external influences, such as heavy rain events, with appropriate measures. SIWA Sewer enables waste water discharges to be reduced by more than 85% in some cases.

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