Increasing efficiency with SIWA Network Management System
SIWA Network Management System – increasing efficiency in the water supply

With the SIWA Network Management System designed specifically for the requirements of the water industry, Siemens helps network operators in the water and wastewater industry achieve their economic and technological optimization potentials in the areas of energy and system reliability.

The SIWA System for drinking water and wastewater networks uses system modules to provide the full range of key management functions, including optimization, simulation, prediction, and monitoring of leaks. The system modules are easy to operate, thanks to the user interface coordinated to SIMATIC WinCC/PCS 7 control technology.

SIWA OPTIM – energy-optimized system operation

The challenge

The efficient operation of your pumps and optimized system scheduling both have a crucial influence on the cost efficiency of the water supply.

The solution

SIWA OPTIM is a scalable management system that supports the operation of (remote) water supply systems. With the objective of minimizing the costs of obtaining energy and water, SIWA OPTIM calculates the most economical pump, well and water tank schedules. Supply reliability and system reliability and availability are ensured at all times. Schedules can also be designed for different scenarios, for example, emergency operation management, maintenance planning, the development of planning variants for conversions or new buildings, or the procurement of backup units.

SIWA OPTIM also ensures the efficient utilization of energy for operating pumps and pumping stations. It assists plant operators in the selection of pump sets and the setting of speeds, and ensures that both fixed- and variable-speed pumps achieve their optimal efficiency. For this purpose, the ideal distribution of pumping current to the individual pumps is calculated for a preset pressure level. The system data required is obtained from sources like the pumps’ characteristics and the system characteristics in all relevant pipeline segments.

SIWA OPTIM uses all of these processes to reduce your energy consumption and operating costs through energy-optimized pump operation.

The benefits of SIWA OPTIM

SIWA OPTIM increases your cost efficiency by:
- Calculating the optimal operating schedules while ensuring operational reliability and a secure supply
- Reducing energy consumption and operating costs by optimizing efficiency of pump operation
SIWA LeakControl – reliable detection and localization of large and small leaks

The challenge
The efficiency and cost-effectiveness of distribution systems are crucially dependent on the fast and reliable detection of leaks and on locating them rapidly. This is vital to preventing occasional cost-intensive damage to structures as well as the loss of precious drinking water.

The solution
SIWA LeakControl helps to detect leaks promptly and accurately to the nearest meter. Leaks are localized in a three-phase process. In the first step, measures are implemented for continuous, fully automatic leak detection. This also allows the location of the leak to be estimated by analyzing the flow rates. Additional sensors are then put in position to locate the leaks accurately to the nearest meter by pinpointing and the use of a correlator.

SIWA LeakControl has a modular design:
- Central unit module for static analysis of flow rates based on time series analysis and the sequential probability ratio test. Daily or seasonal effects as well as extreme variations are taken into account.
- Mass-balancing module for analyzing the mass balance over the entire supply network
- Model-based analysis module that models the water distribution network’s hydraulic data and makes it possible to compare the theoretical and actual network conditions
- Connection to process control/SCADA module for exchanging data between the central unit and the control center/SCADA

The system can easily be installed during operation and is suitable for all pipeline materials. It also offers the option of integrating existing measurement equipment, and is vendor-neutral with respect to connections with SCADA systems.

The benefits of SIWA LeakControl
SIWA LeakControl assists the operators of water distribution networks with:
- Reducing leakage time through continuous monitoring
- Reducing any resulting damage
- Minimizing water loss
- Increasing efficiency and reducing operating and maintenance costs

SIWA SIM – reduced costs and higher reliability through dynamic simulation of pipeline systems

The challenge
In order to guarantee water supply even in extreme situations, operating personnel must have a thorough understanding of the way the system behaves. A real-life simulation enables them to run through critical conditions as well.

The solution
SIWA SIM is a computer-aided system for calculating hydraulic behavior in water supply systems. The operator is provided with dynamic information about pressure and flow for all actual measurement points as well as virtual ones. In this way, the effects of various operator actions and exceptional events can be tested and evaluated without risk.

SIWA SIM allows scenarios to be studied with varied hydraulics or a modified automation model. Through risk-free testing of automation functions, SIWA SIM helps at an early stage to ensure that an automation concept performs properly.

SIWA SIM assists you with the optimization of operating processes during the planning and operation phase of your system. SIWA SIM therefore helps not only minimize your total costs for engineering and start-up but also creates the basis for assessment when expanding the system or adjusting its capacities. SIWA SIM also proves its value in training operating personnel: thanks to an additional integrated training module, operators of water distribution systems can be trained to operate the control system under realistic conditions.

The benefits of SIWA SIM
SIWA SIM helps you:
- Optimize your operating processes while the system is running
- Simulate operating forms, fault states, and structural alternatives for optimizing system operation
- Test automation functions and interactions between system components without risk
- Illustrate complex relationships and procedures for training purposes
- Increase your system’s operating and supply reliability through realistic, scenario-based training
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