Application Story

Industry: Water
Products: Control Systems

Bad Homburg sewage plant

Reference project
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MITSUBISHI ELECTRIC Group
ME-Automation Projects GmbH
Description

When the town of Bad Homburg was granted the status of a spa in 1840, it already had a sewer system. The town’s first sewage treatment plant was commissioned in 1888. In the course of further development, the first mechanical treatment system was built on the site of today’s plant in 1927. In 1954, construction of a new mechanical-biological sewage treatment plant for 35,000 population equivalents was started.

Due to increasing demands on plant throughput, the capacity was increased to 80,000 population equivalents in 1970. During dry weather, the plant treats about 18,000 m³ of waste water every day. On rainy days, plant throughput can increase up to 62,000 m³. With a total volume of some 23,500 m³, the plant’s retention and treatment time is about 30 hours.

Because some of the plant’s most important automation equipment had reached its end of life or was obsolescent, adequate maintenance – and therefore plant reliability – could no longer be ensured. Consequently, there was urgent need to renew the process guidance & automation system. In addition, overall plant efficiency was to be increased by installing modern technology.

In December 2004, the town of Bad Homburg commissioned ME-Automation Projects, formerly known as KH-Automation Projects, to replace the process guidance & automation equipment of the Ober-Eschbach sewage treatment plant. While determining the specifications of the process control system, it became clear that data consistency, distributed system architecture, high reliability, as well as know-how in project implementation were essential requirements.

As with all conversion/upgrading measures of comparable installations, the space available for installing the new automation technology was very limited. All existing automation stations had to be replaced due to outdated equipment. The control cabinets were gutted, and mounting panels were installed for the new Mitsubishi System Q automation stations. Distributed process servers were assigned to all sequence controllers, thereby establishing a clearly structured and hierarchical arrangement of the process control system.

This ensured that expansions had no retroactive effects, and conversion was carried out without interrupting normal operation. By means of redundant data storage and by distributing the process control tasks among several process servers, high levels of availability and reliability were achieved. The conversion/upgrading work was carried out up to the year 2010, and involved integration of the plant’s stormwater tank, sludge treatment, flocculant dosing station, and the flocculant system into the process automation system.

In 2012, another stormwater tank was integrated and the sludge digestion was modernized.
Technical requirements

Process management and sequence control of entire plant from a central location
Operation and monitoring of entire plant from distributed operator stations
Operation and monitoring of entire plant by means of mobile operator stations
Vertical and horizontal data consistency as well as consistent linking to superordinate hierarchies
Consistent data coupling with office network
Conversion during normal operation without retroactive effects
System-wide engineering from a central engineering workplace
Archiving of all relevant measurement values in appropriate compression stages
Strict data consistency in all software tools
Availability of all process values for further processing
Standardized software tools in accordance with IEC 61131-3
Integration of stormwater tanks

Scope of delivery

- Process management system PMSX®pro
- Automation equipment
- Network using switch technology
- Installation & wiring
- Target specifications / engineering / programming
- Documentation
- Factory tests with plant simulation
- Commissioning / trial operation
- Personnel training

Process management characteristics

- Process management system: PMSX® pro
- Topology: distributed system
- Network: optic fiber, Ethernet TCP/IP
- Automation system: Mitsubishi System Q
- Data points: about 5000
- Automation stations: 12
- Operating stations: 10
- Process servers: 8
Excerpt from our reference list

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