Application Story

Industry: Power / Process
Products: Control Systems

Sewage sludge incineration plant Stuttgart-Mühlhausen
Reference project
Sewage sludge incineration plant Stuttgart-Mühlhausen
Stuttgart’s sewage is treated in a total of four sewage plants. Apart from three smaller sewage plants in Möhringen, Plieningen, and Ditzingen, the municipal company “Stadtentwässerung Stuttgart” (SES) also operates the main sewage plant in Stuttgart-Mühlhausen, with a capacity of 1.2 million inhabitant equivalents. Also located on the site of the main sewage plant is a sludge incineration unit with two parallel lines.

In 2006, a new incinerator with a fluidized bed furnace was built to replace the previous incinerator, which had reached the end of its service life. Following mechanical dewatering and the drying process, the sewage sludge is pumped into the fluidized bed furnace. Here, combustion takes place without the addition of auxiliary fuel. In the form of steam, the thermal energy released during combustion is fed to a back-pressure turbogenerator. Hereby, the generated electric power is used to cover the plant’s own power demand.

In order to ensure safe, economic, and environmentally compatible operation of the new fluidized bed furnace, a powerful, highly available and consistent process management system is required.

The process management system is based on a consistent distributed architecture. When expanding or modernizing a plant without interrupting normal operation, a distributed system topology offers decisive advantages. By dividing the process into appropriate function units, an orderly, decentralized, and hierarchical structure is obtained. These functional units are self-contained processing sections that are clearly definable in terms of tasks and boundaries. An automation station with a local process server is assigned to each of these functional units.

The server stores all the engineering data of the respective function unit, and also handles process data acquisition, processing, and archiving. The automation station is responsible for collecting signals and data from the field, as well as carrying out the actual process control and sequencing tasks. Moreover, distribution of the process control & automation tasks in several process servers, together with redundant data storage, ensure utmost operational safety and highly efficient plant operation.
Technical requirements

Process management of entire plant from a central point
Vertical and horizontal data consistency
Automation stations
Distributed process servers
Data acquisition via distributed I/O modules
System-wide engineering from a central engineering workplace
Archiving of all incoming alarms & messages
Archiving of all relevant measurement values in appropriate compression stages
Strict data consistency in all software tools
Function plan documentation
Standardized software tools

Scope of delivery

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

Process management characteristics

- Process management system PMSX pro
- Topology
- Network
- Automation system
- Data points
- Automation stations
- Operating stations
- Process servers

- Topology: distributed system
- Network: Ethernet fiber optic – single-fault tolerant
- Automation system: Mitsubishi System Q
- Data points: about 15 000
- Automation stations: 17
- Operating stations: 6
- Process servers: 8 (2 redundant)
Excerpt from our reference list

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