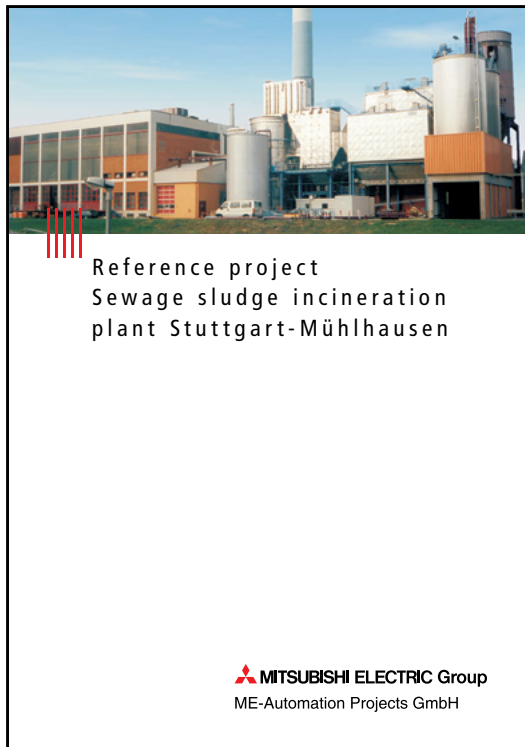


Application Story

Industry: Power / Process

Products: Control Systems

Sewage sludge incineration plant Stuttgart-Mühlhausen



Project of ME-Automation Projects GmbH, a member of the Mitsubishi Electric Group. First published in June 2014.

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Reference project
Sewage sludge incineration
plant Stuttgart-Mühlhausen

Customer:	Stadtentwässerung Stuttgart (SES)
Plant:	Sludge incineration lines WSO II + III
Project value:	~ 2 million Euro
Project duration:	2005 – 2010

Description

Stuttgart's sewage is treated in a total of four sewage plants. Apart from three smaller sewage plants in Möhringen, Plienigen, 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.

ME-Automation Projects, formerly known as KH-Automation Projects, received the order from SES for supplying a turnkey process management & automation system for the new incineration plant. Operation and monitoring of the fluidized bed furnace and the ancillary installations are handled by the PMSX[®] pro process management system. PMSX[®] pro had already been used for process control in the previous construction stages involving automation of the main sewage plant. Decisive for this choice was the planned integration into an overall system for operating the main sewage plant and the sludge incinerator from a combined central control room.

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 | 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

				
Waste incineration plant Frankfurt	Waste incineration plant Iserlohn	Waste incineration plant Weißenhorn	Wastewater treatment plant Erdinger Moos	Wastewater treatment plant Bad Homburg Ober-Eschbach
				
Milk production Regensburg	Energy supply center Dresden	Energy supply center Oberhausen	Pellet production plant Offenbach	Biomass CHP plant Wiesbaden
				
Energy supply center Munich Airport	Waste incineration plant Frankfurt	Drinking water plant Haltern	Sewage network and wastewater treatment plant Hamburg	Pellet production plant Dotternhausen
				
Wastewater treatment plant Düsseldorf-Nord	Waste incineration plant Frankfurt	Waste incineration plant Hamm	Waste incineration plant Frankfurt	Facility Management Control System Dresden
				
Facility Management Control System Nijmegen	Tank terminals Rotterdam	Barthel Pauls Söhne AG Biomass CHP plant	Wastewater treatment plant Stuttgart-Mühlhausen	Wastewater treatment plant Nuremberg
				
Wastewater treatment plant Nidderau	Wastewater treatment plant Landshut	Drinking water plant Friesland		
				
Tank terminal Botlek	Sewage network Wuppertal			

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