

Application Story

Industry: **Water**

Products: **Control Systems**

Düsseldorf-Nord sewage plant



Reference project
Düsseldorf-Nord sewage plant

 **mitsubishi electric** Group
ME-Automation Projects GmbH

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Reference project Düsseldorf-Nord sewage plant

Customer:	City of Düsseldorf
Plant:	Düsseldorf-Nord sewage plant
Population equivalents:	800 000
Project value:	~ 10.0 million Euro
Project duration:	1997–present (in discrete construction stages)

Description

Düsseldorf operates the Düsseldorf-Nord sewage treatment plant on the left bank of the River Rhine. Originally built between 1962 and 1966, the plant was designed for partial (70–80%) mechanical/ biological treatment. In the years 1976 to 1980, the size of the activated sludge section was increased to obtain a higher level of treatment. Because of higher inflow rates, it was necessary to increase the volumes of the activated sludge and the settling tanks in 1991.

With the aim of maintaining sewage treatment operations at a high level, and keeping up with technical developments, the plant was retrofitted and upgraded in several stages during the following years. As part of the conversion and expansion measures, also the automation & process control equipment was revamped in several separate stages to obtain modern and future-proof systems.

Düsseldorf's municipal sewage treatment department contracted ME-Automation Projects, formerly known as KH-Automation Projects, to supply the entire process control and automation technology – including the necessary field instrumentation and the water analysis system – as well as the equipment for extending the low-voltage switchgear systems. For this purpose, the

PMSX[®] pro process management system was selected, as it fully satisfies all the high demands for utmost availability, distributed architecture, data consistency, and the ability to process large amounts of data.

Similarly, due to the complex plant structure with widely distributed processing units, a distributed automation & control system was essential. For an optimum design, the architecture of the new process control & automation equipment had to match the sewage treatment plant's layout. This permitted a clearly structured and hierarchical topology to be implemented. Moreover, the control system's architecture was designed to avoid "single points of failure" that could impair the demanded high plant availability.

The required high levels of availability and reliability were achieved by means of redundant data storage and by distributing the process control tasks among 12 process servers. In this way, the contractually stipulated availability of 99.99% for the process management system was ensured. Full access to all of the plant's process data is provided by each of the 22 operating stations. Hereby, it is particularly important that redundancies in the process technology equipment are not cancelled by the process management system. Thanks to the process management system's distributed architecture, plant conversion was possible without interrupting normal operation.





Technical requirements

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

Scope of delivery

- ▮ Process management system PMSX® pro
- ▮ Automation equipment
- ▮ Network using switch technology
- ▮ Expansion of the low-voltage switchgear system
- ▮ 75 drives with integrated Profibus interface
- ▮ Installation & wiring
- ▮ Target specifications / engineering / programming
- ▮ Documentation / factory testing
- ▮ Video monitoring
- ▮ Commissioning / trial operation / training

Process management characteristics

- | | |
|-----------------------------|------------------------------------|
| ▮ Process management system | PMSX® pro |
| ▮ Topology | distributed system |
| ▮ Network | optic fiber
Ethernet TCP/IP |
| ▮ Automation system | Mitsubishi System Q,
Siemens S7 |
| ▮ Data points | about 20 000 |
| ▮ Automation stations | 36 |
| ▮ Operating stations | 22 |
| ▮ Process servers | 12 |

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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