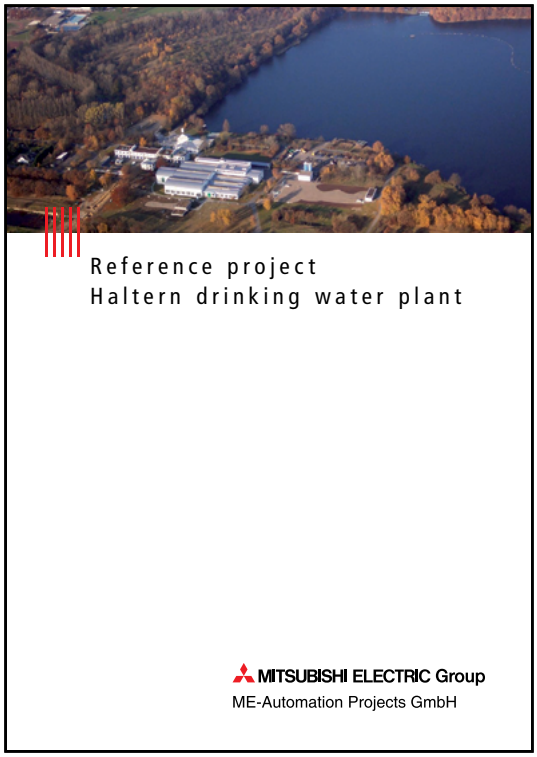
Application Story

Industry: **Water**

Products: **Control Systems**

Haltern drinking water plant



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

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Reference project
Haltern drinking water plant

MITSUBISHI ELECTRIC Group

ME-Automation Projects GmbH

Customer:	Gelsenwasser AG
Plant:	Drinking water procurement and distribution
Project value:	~ 7.0 million Euro
Project duration:	1997–present (in discrete construction stages)

Description

The utility company Gelsenwasser AG supplies water, gas, heat and power to some three million people as well as the trading estates and industrial areas in the Ruhr and Münsterland regions, the Lower Rhine, East Westphalia, and the neighbouring regions in Lower Saxony. Hereby, the main activity involves the supply of drinking water for 46 towns and villages, with a total annual demand of about 290 million m³.

The Haltern plant – one of the largest in Europe – supplies drinking water for roughly one million people as well as businesses and industry in 20 towns of the northern Ruhr area, the Münsterland, and the city of Duisburg. Covering an area of 307 hectares, the Haltern reservoir has a capacity of some 20.5 million m³ of water supplied by the Stever and Mühlenbach rivers. Every year, about 110 million m³ of drinking water are procured, treated, and distributed.

In 1997, ME-Automation Projects – named Philips Automation Projects at that time – was contracted to provide the entire automation system for the Haltern drinking water plant, with the aim of:

- Decentralizing the existing automation technology, and expanding it to cover the overall process
- Increasing the availability of the entire plant
- Ensuring the simple integration of future expansions.

The existing automation technology for water treatment – consisting of five S5 automation systems, the low-voltage switchgear, and the telecontrol system with SINAUT equipment – was completely integrated into the new overall process management concept. Similarly, the contract included modernization of a large part of the existing telecontrol network. Moreover, 27 new Philips automation systems were installed and commissioned for the water procurement operations. The telecontrol equipment in 14 existing stations for water distribution was replaced with modern technology, and standardized in accordance with the overall automation concept. To ensure utmost availability, equipment in the master telecontrol station for water distribution was installed redundantly. The existing automation technology was replaced with compact modules in modern automation stations, which are located in the drinking water plant's decentralized substations. A dual-ring FDDI glass-fiber network with a transmission capacity of up to 200 Mbits/s was used to link the entire process automation system. Also the FDDI network is redundant. All process data from the plant sections Procurement, Treatment, Pumping, and Distribution are transmitted to the central control room. Hereby, four PMSX® operating stations provide access to some 12 000 process variables. In case of changes or plant expansions, the entire process management and automation system can be configured and programmed conveniently via a central engineering station.

Process data are always stored decentrally in the PMSX® process servers, which greatly increases data security and availability. In addition, important measurement values are exported to a central Oracle database for further use by the customer. A central PMSX® server cyclically transfers these values to the database. Modern switch technology is used to connect the automation system to the office network and the networked printers.

Modernization of the entire plant was carried out in several stages during normal operation and with minimum downtimes to ensure an uninterrupted water supply without adverse effects on quality. This was only possible by means of detailed planning and strict adherence to the agreed time schedule. Thanks to close cooperation between customer and ME-Automation Projects, formerly known as KH-Automation Projects, the complex project was even completed ahead of the planned date. Moreover, with the aim of maintaining the plant's high technical level, it was upgraded several times in the following years. This was achieved by retrofitting and process optimization in discrete steps. Apart from the remote links to other drinking water plants, the entire data network was converted to an Ethernet ring using switch technology. During renewal of the 5 kV medium-voltage equipment, the old Philips automation stations were replaced with the Mitsubishi System Q. In addition, four new operating stations were installed. In another conversion phase, the existing PMSX® process management system was migrated to the newer PMSX®pro without interrupting operation.

Technical requirements

Central process management of the plant

Redundant operating and monitoring stations

Redundant fieldbus using optic fiber technology

Integration of remote substations into the overall system

Integration of the telecontrol system

System-wide engineering from a central engineering workplace

Communications link to a plant reporting system using an Oracle database

Archiving of all incoming alarms & messages

Archiving of all relevant measurement values in appropriate compression stages

Strict data consistency

Standardized software tools

Ensuring the simple integration of future expansions

Interface to the company-wide office network

Scope of delivery

- Process management system PMSX® pro
- Automation equipment
- Network technology
- Conversion of low and medium-voltage switchgear
- Installation & wiring
- Target specifications / engineering
- Programming
- Commissioning / trial operation
- Personnel training
- Documentation

Process management characteristics

Process management system	PMSX® pro
Topology	distributed system
Network	optic fiber Ethernet TCP/IP
Automation system	Philips P8, Siemens S5/S7, Mitsubishi System Q
Telecontrol stations	28 SINAUT
Data points	about 14 000
Automation stations	68
Operating stations	10
Process servers	47
Large-screen video cubes	2

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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