Application Story

Industry: Power / Process
Products: Control Systems

Combined heat & power supply in Oberhausen

Reference project
Combined heat & power supply in Oberhausen

Reference project
Combined heat & power supply in Oberhausen
In two locations – Oberhausen Mitte and Oberhausen Sterkrade – the company Energieversorgung Oberhausen AG operates cogenerating plants with separate district heating networks. However, the two networks are coupled by means of a connecting pipeline. The combined heat & power (CHP) plant in Oberhausen Sterkrade uses the waste heat from a chemical company to supply district heat to Sterkrade. The CHP in Oberhausen Mitte feeds the Alt-Oberhausen district heating network. Also in this location is the central control room, from which all heat generation and distribution systems of both locations as well as the combined network are monitored and controlled. Heat is generated mainly by means of combined heat & power plants. The process control equipment in both locations had been installed several decades ago. In order to ensure continued safe and economic CHP plant operation, a completely new and high-availability process management system was required. Another requirement was a significant increase in availability and operational safety of the heat generation and distribution in both locations by modernizing the internal and external process control & automation systems. Moreover, a considerably higher level of automation was demanded. In addition, the operating and monitoring facilities for the plant sections were to be optimized and made more transparent.

The modernization and expansion measures were to be implemented in several stages, as the supply of heat to the customers had to be ensured at all times.

ME-Automation Projects, formerly known as KH-Automation Projects, received the order from Energieversorgung Oberhausen to supply a turnkey solution consisting of installation, commissioning, trial operation, and documentation of the modernization and renewal project. Operation, monitoring, and process control of the two cogenerating plants is done by means of a PMSXpro process management system located in a central control room in Oberhausen Mitte. Thanks to the plant’s horizontal structure in function units with clearly assigned process management areas, an exceptionally high level of operational safety and flexibility is achieved. As the availability of the control system has a direct influence on overall plant availability, the demands placed on system reliability are particularly high. By means of active redundancies, and by avoiding “single points of failure” in the architecture, it is possible to achieve the high availability demanded for the control system. Moreover, the system’s distributed architecture, and the use of modern switch technology prevent overloading the system bus. Similarly, 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. All process data are cyclically stored in an integral backup system, so they are available redundantly throughout the system. Apart from the internal control & automation equipment for the CHP plants, also the external process management system will be renewed and modernized. In particular, this involves renewal of the burner controls, replacement of electrical actuator drives, installation of new measurement and signalling equipment, and increasing the number of actuators and sensors to achieve a higher level of automation.

In another construction stage the central control room was rebuilt and modernized.
Technical requirements

Process management of both CHP plants from a central point
Significant increase of the automation level
Vertical and horizontal data consistency
Highly available automation stations in redundant architecture
Distributed system architecture with redundant local process servers
System-wide engineering from a central engineering workplace
Data acquisition via distributed I/O modules
Time stamping of relevant signals in distributed modules
Plant-wide redundant fieldbus using optic fiber technology
Consistent data coupling with office network
Archiving of all incoming alarms & messages
Archiving of all relevant measurement values in appropriate compression stages
Strict data consistency in all software tools
Access to all process values from the office environment
Function plan documentation acc. to VGB-R 170 C
Dynamic function plans
Standardized software tools

Scope of delivery

- General contractor for electrical and process control equipment
- Process management system PMSX® pro
- Automation technology – redundant
- Local process servers – redundant
- Burner control systems
- Network using switch technology
- Renewal of actuators and control equipment
- Renewal of field instrumentation
- Low-voltage switchgear
- 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, Siemens S7
- Data points
-about 40 000
- Automation stations
- 24 (partly redundant)
- Operating stations
- 7
- Process servers
- 10 (also redundant)
- Large-screen display
- 3 full-HD 70” TFT
Excerpt from our reference list

- **AE&E**: Waste incineration plant Frankfurt
- **AMK**: Waste incineration plant Sieurlohn
- **AWB**: Waste incineration plant Weilhshorn
- **AV**: Wastewater treatment plant Elingher Moos
- **Bad Hamburg**: Wastewater treatment plant Bad Homburg Ober-Eschbach
- **Biomass CHP plant**: Wiesbaden
- **Energy supply center**: Munich Airport
- **Energy supply center**: Dresden
- **Evo**: Energy supply center Oberhausen
- **ESWE**: Pellet production plant Offenbach
- **juwi**: Biomass CHP plant Wiesbaden
- **Landshauptmannamt Düsseldorf**: Wastewater treatment plant Düsseldorf-Nord
- **mainova**: Waste incineration plant Frankfurt
- **MHB**: Waste incineration plant Hamm
- **MHKW**: Waste incineration plant Frankfurt
- **M+W GROUP**: Facility Management Control System Dresden
- **NXP**: Facility Management Control System Nijmegen
- **Odfell**: Tank terminals Rotterdam
- **Bartel Paul Söhne AG**: Biomass CHP plant Stuttgart-Mühlhausen
- **PWS**: Pellet production plant Dotternhausen
- **R-202-2-0314**: Wastewater treatment plant Nuremberg
- **R-202-2-0314**: Wastewater treatment plant Nuremberg
- **Tank terminal**: Botlek
- **Wastewater treatment plant Niddereau**: Landshut
- **Wastewater treatment plant Landshut**: Friesland
- **WSW**: Wastewater treatment plant Wiuppertal

**www.me-ap.de**

**GERMANY**
ME-Automation Projects GmbH
Kasseler Straße 62
34277 Fulda
phone +49 (0)561 58540
fax +49 (0)561 5854530
e-mail: info@me-ap.de
www.me-ap.de

**NETHERLANDS**
ME-Automation Projects
Science Park Eindhoven 5008 A
5902 EA Son
phone +31 (0)40 26 79 900
fax +31 (0)40 26 79 919
e-mail: secretariaat@me-ap.eu
www.me-ap.eu

**MITSUBISHI ELECTRIC Group**
ME-Automation Projects GmbH