Application Story

Industry: Power / Process
Products: Control Systems

Waste incineration plant Hamm

Reference project
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MITSUBISHI ELECTRIC Group
ME-Automation Projects GmbH
Description

The waste incineration plant in the city of Hamm was designed for the thermal treatment of municipal waste. Originally commissioned in 1985, the Hamm plant mainly incinerates domestic waste, but also commercial waste and bulky refuse.

Several plant extensions increased the incineration capacity to 295,000 t/year in order to handle the refuse from the cities of Hamm and Dortmund as well as the rural districts of Unna, Soest, and Warendorf. Each of the four identical combustion lines has a throughput of 10 tons/h. Normally, combustion is completely self-sufficient, without the need for supplementary fuels such as paper, etc. The heat of the flue gas produced during combustion is used to generate steam, which is fed to the three turbogenerators for power generation (approx. 26 MW installed capacity).

With the aim of maintaining the waste disposal operations at a high technical level, and to meet tighter environmental regulations, the plant was retrofitted and upgraded in several stages during the following years. After many years of reliable operation, and due to increasing difficulties in obtaining spare parts, the maintenance costs required to ensure continued operational safety had increased significantly.

It was therefore decided to renew the entire process management & automation system. In addition, overall plant efficiency was to be increased by installing modern technology and automation functions.

In 2004, ME-Automation Projects (formerly known as KH-Automation Projects) was contracted to renew the plant’s process management and automation equipment, including a combustion control system. During assessment of the new process management system, the distributed architecture of PMSX®pro, its data consistency, and its high availability and reliability were decisive factors. The four lines were successively upgraded, whereby a very tight schedule had to be observed. For this purpose, the distributed architecture of the PMSX®pro process management system proved to be ideal. It was therefore possible to conduct all the conversion work during the regular maintenance shutdown periods of the four waste-heat boilers. What’s more, this approach avoided unplanned downtimes & start-ups, with all the associated economic disadvantages. The new combustion control system was tuned to provide optimum burnout of the refuse with maximum energy utilization, and to ensure highly efficient plant operation.
Technical requirements

Process management of entire plant from a central point
Vertical and horizontal data consistency
Redundant automation stations
Redundant FSC automation stations
Redundant process servers
Data acquisition via distributed I/O modules
Time stamping in distributed modules
Plant-wide redundant system bus using optic fiber technology
Consistent data coupling with office network
System-wide engineering from a central engineering workplace
Archiving of all incoming alarms and 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
Standardized software tools

Scope of delivery

- Process management system PMSX® pro
- Automation equipment – redundant
- Automation equipment – redundant, with fail-safe technology
- Network using switch technology
- Large-screen displays and video monitoring
- Combustion control
- Installation
- 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 (redundant)
- Data points - about 15,000
- Automation stations - 14, of which 13 are redundant
- Automation stations (FSC) - 4 (redundant)
- Operating stations - 8
- Process servers - 7 (redundant)
- Large-screen display - 2 cubes
Excerpt from our reference list

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