

The Ruhleben Waste-Incineration Plant Automated with System 800xA



The plant

The Ruhleben waste-incineration plant is a facility of the Berlin municipal sanitation department. It has been designed for an annual capacity of 520,000 tons and is the core of the Berlin waste disposal system. In order to prevent today's city waste from becoming tomorrow's contamination sites, the latest legislation on this issue provides for dumping "inert" material only, starting 2005. This means that waste material must be biologically and chemically inactive in order to be allowed to be dumped on domestic waste disposal sites. However, according to today's state of the art, the values specified in the TASI instructions (technical instructions for municipal solid waste) can be safely achieved by subjecting the material to thermal treatment (incineration).



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The Ruhleben waste-incineration plant consists of a furnace for municipal solid waste, with eight boiler lines, one flue-gas cleaning plant per boiler line, and one DeNOx system for the flue gas.

The task

To date, the plant has been operating with a third-party process control system from the 1980s that is no longer being manufactured. In order to be able to fulfill the waste-disposal contract with the state of Berlin, the existing process control system needs to be renewed completely for reasons of an assured plant availability. The measures will have to comprise safety-relevant control equipment (protection systems) and power controllers.

The project will include the renewal of the entire process control equipment for 8 boiler lines, along with the associated flue-gas cleaning and DeNOx systems, by the end of 2007, as well as the installation of an Operation Management System. The scope of the automation is defined by an estimated bill of quantities:

| I&C Functions | Qty. |
|-----------------------------|------|
| Analog signal conditioning | 2050 |
| Binary signal conditioning | 9800 |
| Single-loop binary controls | 1350 |
| Analog-control actuators | 400 |
| FG controls | 180 |
| Master controllers | 110 |
| MODBUS interfaces | 21 |
| Electronics cabinets | 35 |
| Distributed subracks | 23 |
| Graphic displays | 250 |

The control solution

The Berlin municipal sanitation department decided on having ABB's System 800xA installed, combined with AC 870P controllers. System 800xA will offer the entire spectrum of the functionalities needed in this project, while assuring a consistent user interface philosophy.

The range of functions exceeds traditional operating and monitoring systems by far and integrates information management, engineering and optimization functions. It enables context-based direct access to plant-wide and company-wide information.

Lengthy searches for information at different locations, computers and applications will be a thing of the past. Users will be able to navigate intuitively through the entire plant and never lose sight of the overall picture.

System 800xA offers proven displays, alarm lists, process graphics, faceplates, and trend displays. Thanks to a consistent view of all the information, all users can use tools needed to fulfill the operational requirements of the waste-incineration plant.

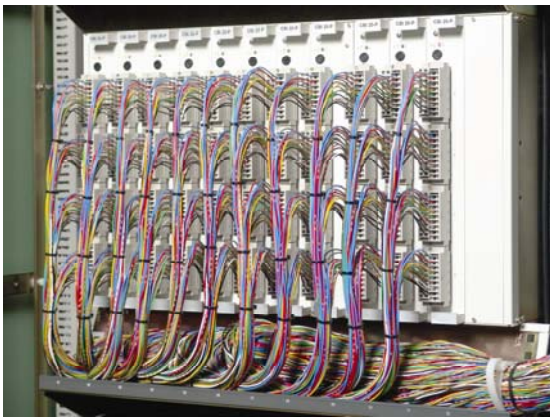
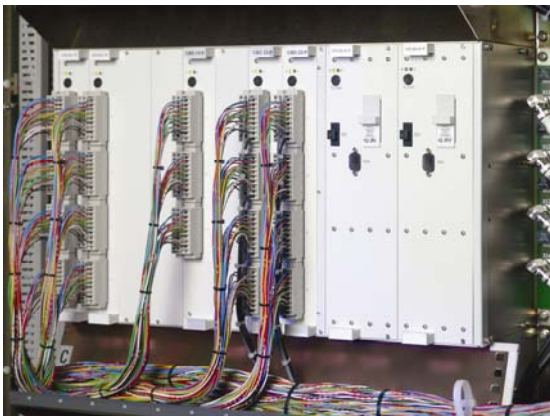
Operators can access any relevant displays and information quickly, flexibly and safely, and can thus monitor and operate the process efficiently and accurately.

System 800xA displays a fully detailed plant overview in the header which allows quick access to all alarms and process graphics.

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With the user interface of System 800xA, operators can go directly from the header to any associated plant display. Moreover, the header indicates, for each boiler line separately, how many messages are pending and which ones take topmost priority.

The alarm list can be sorted by a number of elements. This is useful, for instance, when the operator wishes to sort the messages by time, KKS code, or priority. For further analysis, the alarm list can be imported directly into Excel through "Copy and Paste".



Subrack with redundant AC 870P processors (top, on the right) and with input subassemblies (bottom) in the Ruhleben waste-incineration plant

The Operation Management System

The functions of archiving, display and operation management will be implemented by means of the ABB Power Generation Information Manager (PGIM) which makes data and functionalities available in the form of integrated functions or aspects of the System 800xA operating and monitoring system. This way, users can use data and functionalities from the office environment via specialized clients.

On the basis of the archived process data, evaluation is possible on the fly; also, trend displays offer functionalities for examining limit values, etc. Moreover, the system provides for continual online calculation, e.g. of heat quantities and outputs. For this purpose, calculation modules for enthalpy calculation and additional process-specific calculation modules have been incorporated.

Reports are generated on the basis of the PGIM reporting function. By means of an MS Excel add-in, the system can access archived values of the archive database. A scheduler will process the pending reports automatically.



Control room of the Ruhleben waste-incineration plant

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The Operation Management System is laid out to interact with the SAP system of the Berlin municipal sanitation department later on. Data on the inventory or on purchase orders can be made available by importing the purchase order status from the SAP system.

The new control system will include an electronic shift book as well as a job order/repair slip system that will replace the paper-based procedures of the past.

Project schedule

ABB successfully commissioned the first stage of the process control system and the Operation Management System.

In 2005, the process control system for the common part as well as for two boiler lines was replaced, the equipment for four additional boiler lines will follow in 2006. Two additional systems are envisioned to be modernized in 2007.



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