

## Heat generation process in Elektrociepłownia Gorzów S.A. controlled by Wonderware System Platform

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*“Fast and precise results analysis of heat and electric energy production influences the economical results of the whole company. Moreover the system assists the company with monitoring of sale contracts realization on the Energy Balance Market.”*

Andrzej Sz wajkowski, Chief of Automation & Heat Measurement Dept., Elektrociepłownia Gorzów S.A.



### Company Overview

Elektrociepłownia Gorzów S.A. - Gorzów Wielkopolski, Poland

The main goal of Elektrociepłownia “Gorzów” SA is production of electric energy, production of heat (steam and hot water), and distribution of heat (steam and hot water). The company is situated in western part of Poland delivering heat and power for city of Gorzów. The company was one of the first in Poland putting into operation the gas-and-steam production unit.

*Wonderware System Platform-based solutions applied in Elektrociepłownia Gorzów S.A. are very important component of production management and effective tool for production quality definition. Fast and precise results analysis of heat and electric energy production influences the economical results of the whole company. Moreover the system assists the company with monitoring of sale contracts realization on the Energy Balance Market.*

Elektrociepłownia Gorzów S.A. is the producer of heat and electric energy functioning in the west part of Poland. Visualization, adjusting and controlling system was implemented as an investment, helping to maintain quality parameters of produced heat and electric energy, according to clients requirements, and enabling production process monitoring, which allows optimization of production costs.

Introducing the technological processes control system, based on modern software and hardware solutions, is first of all economically justified. Data recording server completely displaces analog measuring apparatus, which operating costs are onerous; savings are also connected with the lack of panel elements. Reducing to minimum the relay-contactor equipment in control and safeguard systems (these functions are implemented in PLC controllers' logic) results not only in radical costs decreasing (including operating costs), but also in whole installation safety.

Current configuration of the system is a result of series of modernizations ran according to growing company's needs. In a year 2000 conception work for the first version began, then stage-implementation of visualization, data storage and controlling system for heat and electric energy production technology. It was assumed, that the whole system communication would be accomplished over the Ethernet network, with separate industrial network, and with taking into consideration current and historical data distribution to the office network.

Basing upon opinions of many companies, which have implemented controlling and monitoring systems in power industry, users' experiences, and many months of individual tools testing, Wonderware software was chosen. Visualization was implemented in Wonderware InTouch HMI (Human Machine Interface) and Wonderware Historian (formerly known as IndustrialSQL Server or InSQL) industrial database was used for the purpose of data storage.

Some time later, in a range of visualization and recording

# Power, Utilities

## InTouch HMI, Wonderware System Platform

important data, a necessity of integration the system with other external systems emerged. Successive areas of production and commercial activity were connected to the system, thanks to the possibility of unbounded development of visualization.

One of the challenges was Electric Energy Balance Market introduced in second half of the year 2000, in which Elektrociepłownia Gorzów S.A. indirectly participates from the very beginning. To fulfill growing requirements imposed by this market, a tool assisting production devices, and current deviations monitoring in area of electric energy contracts realization, was created according to self-elaborated conception.

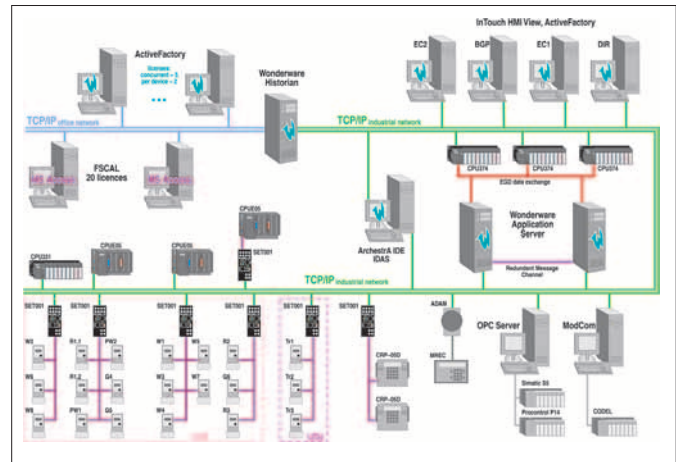
Electric energy counters with a function of remote data



Machine room inside Elektrociepłownia Gorzów

transmission to the Wonderware Historian were used for this purpose (simultaneously with Distribution Network Operator). Once a day data readout and time synchronization of 20 electric energy counters is made. Elektrociepłownia Gorzów S.A. owns a gas-steam block, supervised with Procontrol system. Confidence in developed visualization system and growing operating demands caused a decision about coupling Procontrol system with Wonderware Historian database.

The system was developed during the investment, connected with a modernization of method of transferring heat into a heat distribution network. According to assumptions, three parallel operator stations were built, with an access to every heat water source each. System was built and started by Abis company.



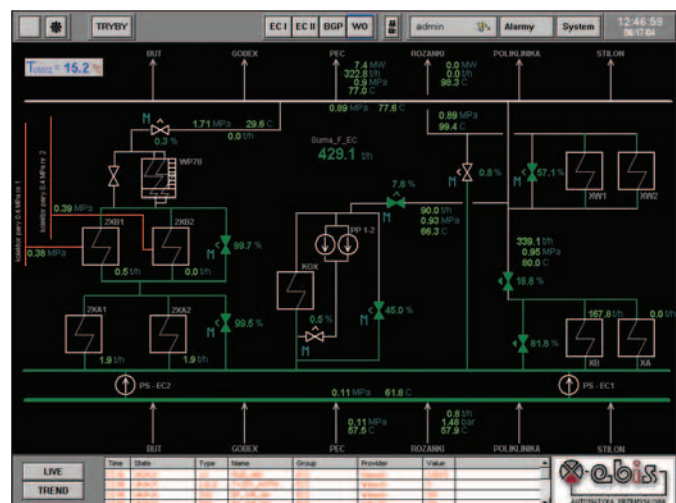
System diagram

It contains 3 InTouch HMI nodes, 3 ActiveFactory software applications and 3 GE Fanuc 90-30 PLC controllers.

System data is stored in Wonderware Historian, while office network computers have ActiveFactory software installed. There is also MS Access application for technological part running in system.

Due to owning a Customer Support Contract for Wonderware software, Thermal-Electric Power Station Gorzów is able to update versions of the software used in application cost effectively.

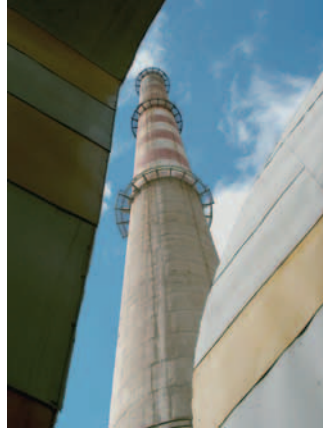
After an analysis of needs, in 2007, it was decided to migrate the application to the newest technology based on ArchestrA technology. To gain fully from benefits offered by the new Wonderware System Platform, system integrator (company ABIS from Krakow), reengineered supervisory level of the system. Thanks to that it was possible to benefit from higher availability of the system by using redundancy features, not accessible in earlier version of the application. Redundancy was implemented by coupling Wonderware Application Servers and using IDAS function (local data logging during failover state) offered by Wonderware Historian.



InTouch HMI software heat exchanges screen



Elektrociepłownia Gorzów power plant



Modernized operation stations are equipped with Wonderware InTouch View licenses, responsible only for visualization, whilst all the application's logic is running safely on redundant Wonderware Application Servers.

*“Doing a migration of advanced multi-nodes InTouch application to system platform based on Industrial Application Server, we have an opportunity to check*

*functionality offered by modern Wonderware technology.”*  
– said Lukasz Stec, co-owner of ABIS s.c. – *“The application which was expanding through many years, had to be cleaned up and structured in order to leverage all object capabilities of new system platform. Thanks to full redundancy software and hardware features, all necessary work was done ‘online’ without any disturbance for the operators. I would say that working with Wonderware Application Server is a totally new experience in term of quality for application development engineers as well as for the operators.”*

Wonderware solutions applied in Elektrociepłownia Gorzów S.A. are very important component of production management, and effective tool for production quality definition. Fast and precise results analysis of heat and electric energy production influences the economical results of the whole company.

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Andrzej Sz wajkowski, Chief of Automation & Heat  
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