Wonderware Russia

ОТКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО
МАГНИТОГОРСКИЙ
МЕТАЛЛУРГИЧЕСКИЙ
КОМБИНАТ

Success story

Iron and steel industry, industrial power supply

Wonderware System Platform, InTouch

Automated supervisory control system of electrical facility, Magnitogorsk Iron and Steel Works

Company name: Magnitogorsk Iron and Steel Works OJSC (MMK)

The Magnitogorsk Iron and Steel Works OJSC (MMK) is the largest enterprise of Russia's iron and steel industry, the Company sold 20% of its finished products in the domestic market. *Iron and Steel Works* *Iron and Steel Works* MMK's plant in Russia is a large steel producing complex encompassing the entire production chain, from preparation of iron ore to downstream processing of rolled steel.

Today MMK turns out the broadest range of steel products among the and CIS Russian. A significant portion of its output (about 40 %) is exported to various parts of the world.

In 2007, MMK produced 13 261 t of crude steel, 12 824 t of hot rolled flat products and 12 203 t of commercial products.

A Branch of Industry: Iron and Steel Industry, Industrial Power Supply.

Location: Magnitogorsk, Chelyabinsk region, Russia.

A Field of Application/Process

Automated Supervisory Control System of OJSC (MMK) production facility and its electrical network and electric substations including Magnitogorsk Main Load Node. Magnitogorsk Main Load Node means 1300 MW consumed power, 615 MW generated power, several hundred kilometers of aerial lines of 10-110 KW, 8000 km of cable lines with applied voltage of 3-110 KW, five major electric power substations which are a part of electric power network ChelyabEnergo, more than 50 transformer and converter substations, own electrical power units as TPP (Thermal Power Plant), Central Power Station, Float Wave Electric Power Station, Steam Generating Plant, a minor TPP and a Gas Compressor Station. Apart from OJSC (MMK) the Magnitogorsk Main Load Node supplies also other industrial facilities of the city as well as BashkirEnergo (Sibay), electric haulage of Magnitogorsk - Kartaly, Krasnaya Gorka, etc.

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Tasks of the new system

Automated Supervisory Control System of OJSC (MMK) production facility resolves the following issues:

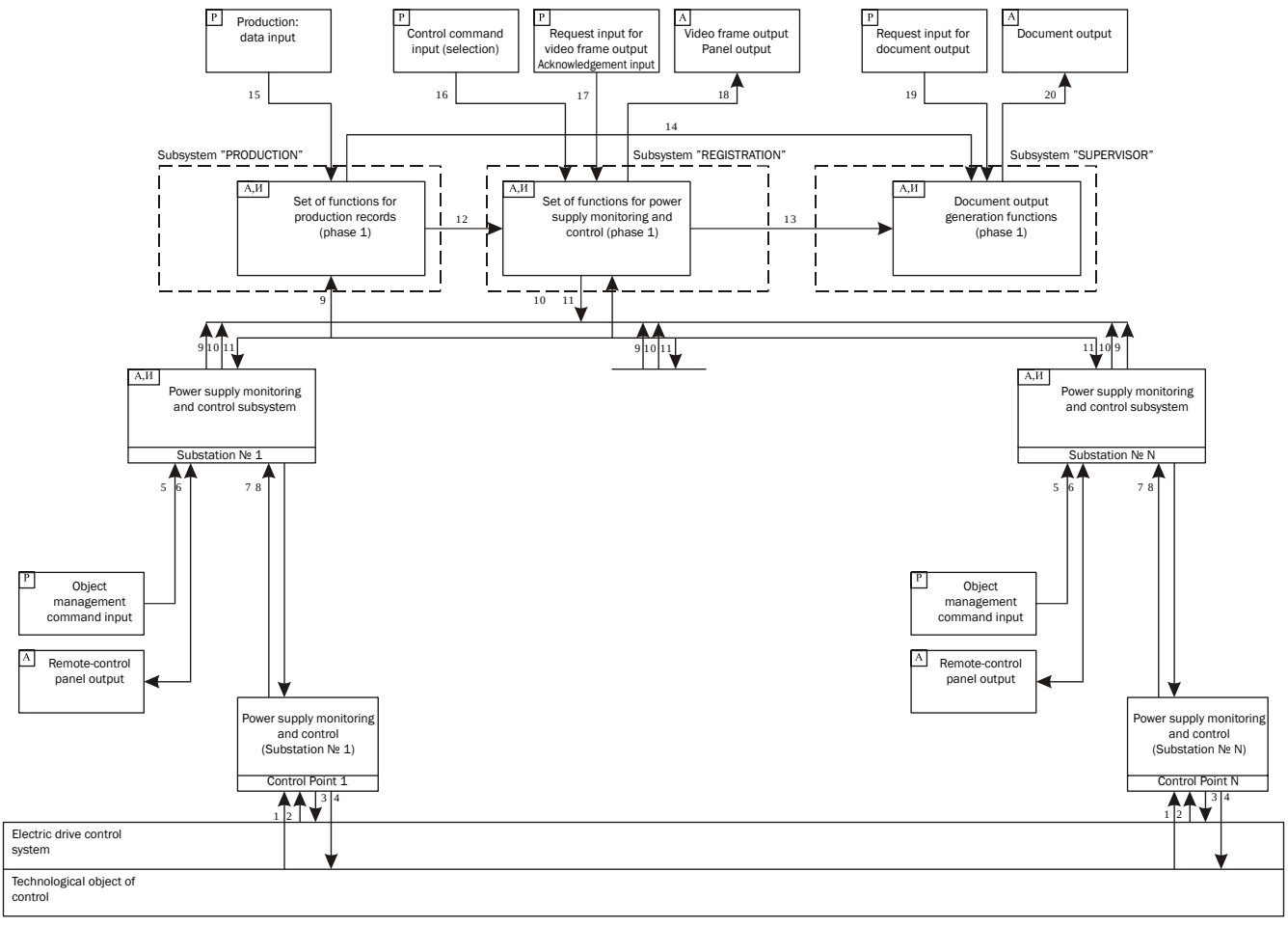
- Integration with the relay protection equipment;
- Archiving, including emergency cases;
- Work-site arrangement of a dispatch operator (WKS of a remote control operator, WKS of historical events, WKS of daily logs and changeover sheets), work-site arrangement of an on duty operator of substation, work-site arrangement of a remote control engineer, work-site arrangement of relay protection engineer;
- Analysis of operation performance and reliability enhancement of power supply system;
- Power consumption and generation records of the whole system of Magnitogorsk Main Load Node;
- Generation of load balance.

System Concept

Automated Supervisory Control System of OJSC (MMK) has been developed as a decentralized two-tier system providing information, management and dispatch functions. The level of basic automation includes local microprocessor systems on programmable logic controllers (PLC). The level of coordination includes dialogue system between the technology staff and Automated Supervisory Control System as well as a visualization and dispatching system of the control object in general.

Functional diagram of the system is depicted in Figure 1.

A solution of the aforementioned tasks is developed on Wonderware System Platform software products. A remote control server is based on the Industrial Application Server (IAS) software and is set to organize the reception of telemetric information and transmission of control signals to the main computer software of controllers, as well as work with InTouch client applications, archiving, routine switching logs, electric power generation and consumption logs, load balance calculation.



Picture 1. System functional diagram

Wonderware Historian automation database provides records of historical tags and transmits information to remote servers of interested organizations involved in the transmission and distribution of electric power.

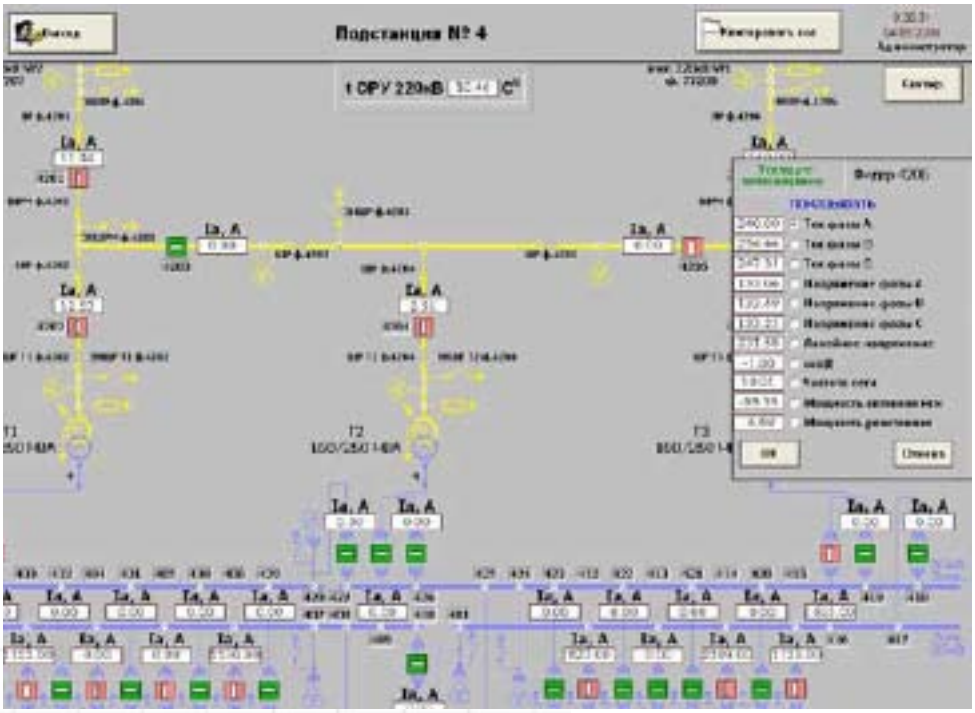
A corporate network site has been developed using SuiteVoyager software.

WKS of on duty electricians have been developed using InTouch Runtime.

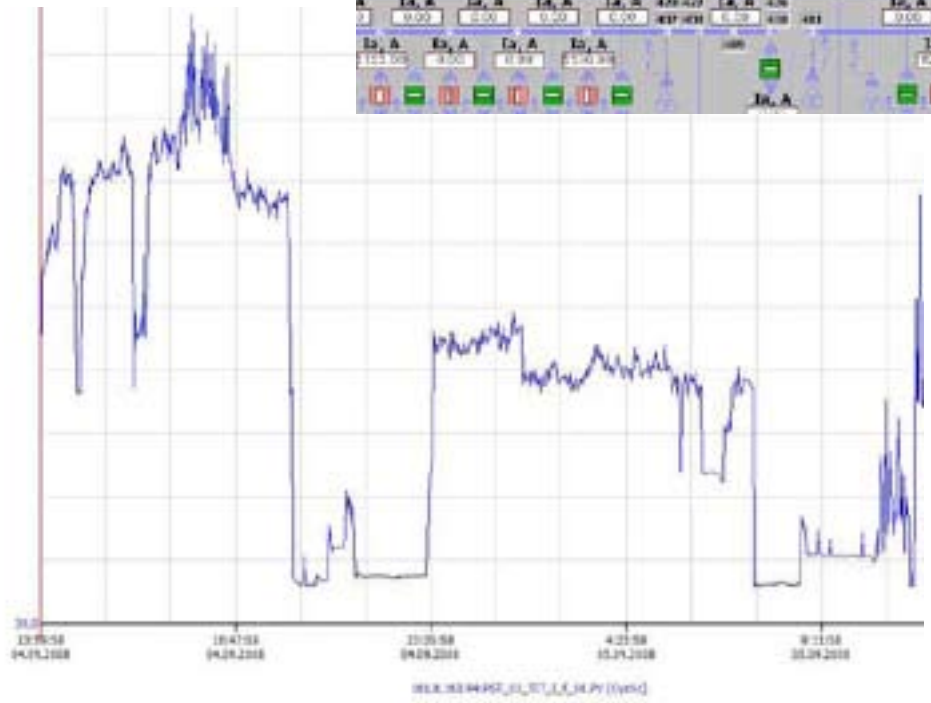
Progress of Work and Gained Experience

System development, installation and system debugging were implemented by the staff of Central Electrotechnical Laboratory of OJSC (MMK).

More than 100 templates have been designed by experts of the Laboratory using the integrated development environment (IDE) to simplify significantly addition of substation sites of identical features and processing techniques. Real time Historian database server stores up to 25000 of required tags.



Substation operator interface 80



Load current, system № 3, feeder 3-08

Technological Advantages Resulting From the Application of New Wonderware Products

Industrial Application Server has a variety of tools for data integration, heterogeneous third-party hardware and software, that simplifies substantially the development process of visualization and process control systems.

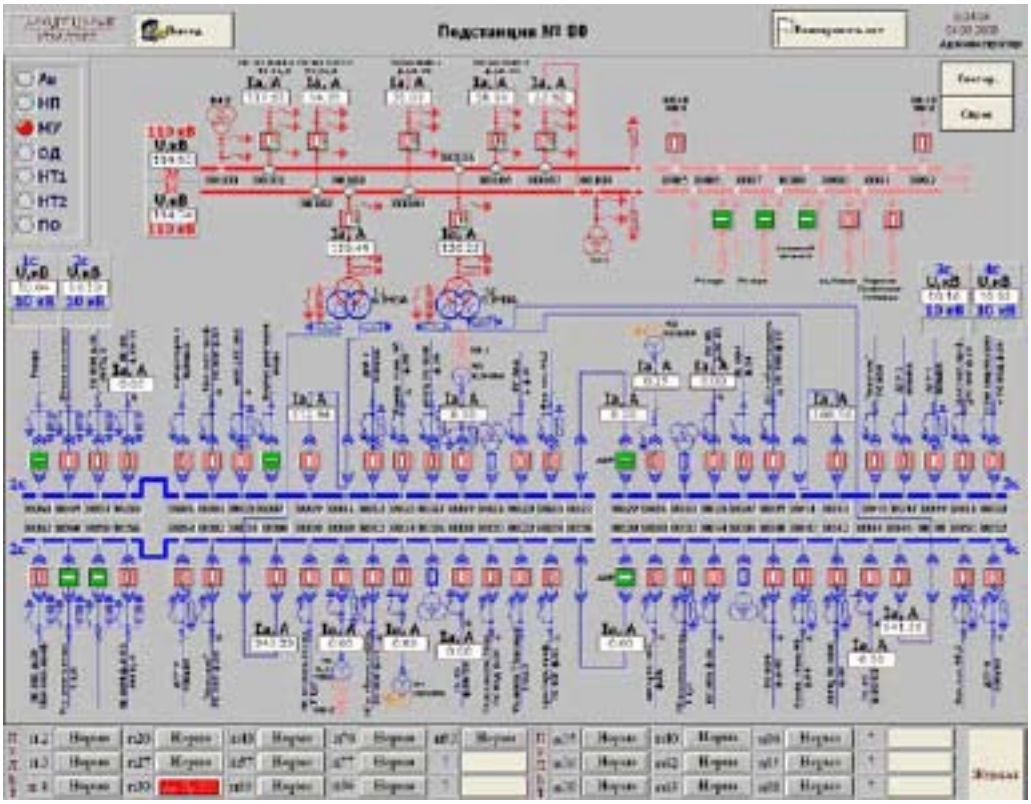
Built-in capabilities of a host server's redundancy can secure from physical hardware failures. Archive server Historian provides a high reliability and speed, and its Archive Viewer has been designed as user-friendly, thus simplifying the process of training for external users of Automated Supervisory Control System of Electrical Facility.

There is up to 12000 increase of the number of processed signals as well as an availability of integration with microprocessor modules of relay protection and emergency control system that result in Automated Supervisory Control System.

Commercial Benefits Resulting From the Application of New Products Wonderware

Implementation of Automated Supervisory Control System of Electrical Facility has enhanced the reliability of power supply system in general, increased the range of performance of the dispatcher control - both in regular operation mode and in emergency situations, reduced the time required for performance analysis of electric power supply services. All these features help to reduce the energetic component in prime cost of steel products by OJSC MMK.

This document has been prepared with the participation of experts of Central Electrotechnical Laboratory of OJSC MMK.



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