

## Metal Products

ActiveFactory software, InTouch HMI, Wonderware Historian, Wonderware Information Server Shijiazhuang Iron & Steel

# The Real-time Information System at Shijiazhuang Iron & Steel

by Wonderware China

*“Shigang’s real-time database system is a perfect tool in the steel manufacturing process. Many applications have been created using this solution and have become an essential tool in the plant.”*

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### VALUE DRIVERS

#### Goals

- Create a central real time database that will provide analysis capability to improve the steel manufacturing at Shijiazhuang Iron & Steel;
- Use the real time Information Management System to increase yield and lower cost of energy and resources.

#### Challenges

- Integrate the different hardware solutions at Shijiazhuang Iron & Steel into a unified control system;
- Link all the existing software into the real time database management solution;
- Link the plant floor database to the central ERP system.

### KEY METRICS

#### Wonderware Solutions

- ActiveFactory software;
- InTouch HMI;
- Wonderware Historian;
- Wonderware Information Server.

#### Results

- Wonderware software provides a unified and integrated real-time information platform that support many of applications in the steel manufacturing process;
- The data analysis helps the plant’s decision makers to make timely decisions;
- The solution enables the integration of all automation control systems that are installed in the plant.

### Company Overview

Shijiazhuang Iron & Steel Co. Ltd. (Shigang) is a leading company in the Chinese metal industry. Located in Shijiazhuang city, the capital of Hebei province, it is one of the most important commercial centers in North China. Its convenient transportation system and its geographical location make it the business door of Beijing and Tianjin province. Built in 1957, Shigang now has an annual capacity of 2 million tons of steel and is shifted its manufacturing from normal steel production to special steel that produces products for the automobile steel. It is an important large to medium scale integrated enterprise and one of the 520 National Key Enterprises of China. It is also one of the 500 National Strong Enterprises and Information Construction Enterprises of 2003 and was awarded the national “May the first” prize in 2000. In 2004, it sold RMB 6.552 billion in products with an impressive RMB 440 million in profits.

Presently Shigang uses Wonderware software in the plant's sintering, iron making, steel making, and steel-rolling. Each of these processes has different production tasks and manufacturing steps. Before the use of Wonderware Software, the automation control system was supplied by different manufacturers, each with a different means of operation. Each piece of equipment collects or manages segmented data corresponding to its specific area of operation. The data collection frequency and storage time are hampered by the limited capability of the CPU and hardware of each individual area specific control system.

This kind of system limits the operation of the large-scale manufacturing at Shigang. It chose Wonderware software because it provides a unified and integrated enterprise-level real-time information platform to support the many applications in the steel manufacturing process.

Due to the fast scanning rate and huge data capacity requirements during the manufacturing process, a traditional database system is unable to fulfill the need for real-time information management. Shigang relies on the Wonderware Historian to provide a unified and integrated enterprise-level real-time information platform. The Wonderware Historian's database integrates real-time data from the individual DCS and PLC system on the plant floor, while enabling the storage of historical data for long periods of time. It enables remote control of the plant processes to the office desk, improving production management and increasing production efficiency.

The data analysis from the Wonderware Historian is sent to ERP and other manufacturing applications, helping decision makers in the plant to make timely decisions.

### The Features of the Shigang Project Implement integration from Plant Floor to Office Desk

Currently, the Wonderware Historian is already connected to more than 30 different DCS and PLC



On-site control



Data analysis room

systems from different areas of the plant; it collects the records of more than 4000 points in real time. The Wonderware Historian enables the publishing of real-time and historical data, and sends this information to more than 100 monitoring screen shots at the management tier. Technical staff and managers can login on Internet Explorer with authorized user names on any computer to monitor the manufacturing situation at real time.

### Create An Integrated and Shared Real-time Information Platform for the Manufacturing process

The Wonderware Historian acquires and stores plant data, and integrates the real-time and historical plant data together into a common database. Shigang can then access all plant information, analyze, manage and report the data through different clients. As Wonderware Historian is equipped with MS SQL Server2000, any application using SQL, ODBC or OLE DB can conveniently acquire data from the Wonderware Historian.

### Enable the connection between the various different databases and control systems

The Wonderware Historian enables the integration of almost all automation control systems that are installed in the plant. All these are entered into the real-time database system.

In Shigang, there are different small-scale data collection systems throughout the plant that were created using VB, VC, Forcecontrol and KingView etc. An OPC Server was developed to collect data from these different systems in the field into the Wonderware Historian. This helps to enable the real time data collection of discrete

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databases, and relationship databases such as MS SQL Server, Access etc.

#### 4-levels of Network Structure and Network Security Design

There are four levels in the architecture of the Shigang plant. The first level is the various automation control systems that automate the individual manufacturing process. This includes control systems from SIEMENS, ABB, AB, Yokogawa, etc. that uses a variety of communication protocol that includes Industrial Ethernet, Profibus and L2 Communications.

The second level is comprised of the remote computers that exchange, forward and store data.

The third level is Wonderware Historian and Wonderware Information Server.

The fourth level is comprised of the different client application computers that are run Internet Explorer with ActiveFactory client application software.

#### Real-time information in steel production

Nearly 90% of the data analyses in the real-time database are sent to the ERP and other applications. The system not only can provide traditional inquiry analysis functions like search by contract numbers, production order and furnace numbers but it also can search by specific keywords such as steel type, production date to better manage the manufacturing process. Once an error is identified in the production, you can easily trace it back using the collected data. This information can then be sent to the managers so they can decide on the right course of action.

The real-time database system helps in the management



Operation and control room

of the energy measurement network. First, the energy measurement data in each section of the plant are easily integrated without modifying any program. Second, the new energy measurement point can be connected directly to any plant section that has a connection to the real-time database

#### In Conclusion

Shigang's real-time database system is a perfect tool in the steel manufacturing process. Many applications have been created using this solution and have become an essential tool in the plant.

Now, Shigang uses the real-time information system to analyses various processes in the steel manufacturing.

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