

# Arkansas Steel Adopts FactoryTalk® VantagePoint To Integrate Data Access for Portal Viewing

Leading producer of railroad tie plates for North America adopts EMI for batch optimization and ISO 9000 product quality improvement.

## Solutions

The FactoryTalk® VantagePoint software serves as the central access point for aggregating data from any Arkansas Steel applications on the plant floor or at the enterprise business level.

## Results

- It connects easily to virtually any data source so information is accessible from any Arkansas Steel control systems, historians, HMI systems, MES tracking and enterprise applications.
- The Unified Production Model allows for creation of a logical model of all plant operations, including the furnace, caster and ladle metallurgy systems, delivering data to operators via dashboards in the FactoryTalk VantagePoint portal.
- It incorporates powerful tools for trending, X-Y plotting and report generation, as well as high-quality presentation tools for creating web reports, dashboards and portals.



Arkansas Steel's twin caster operations, Newport, Arkansas.

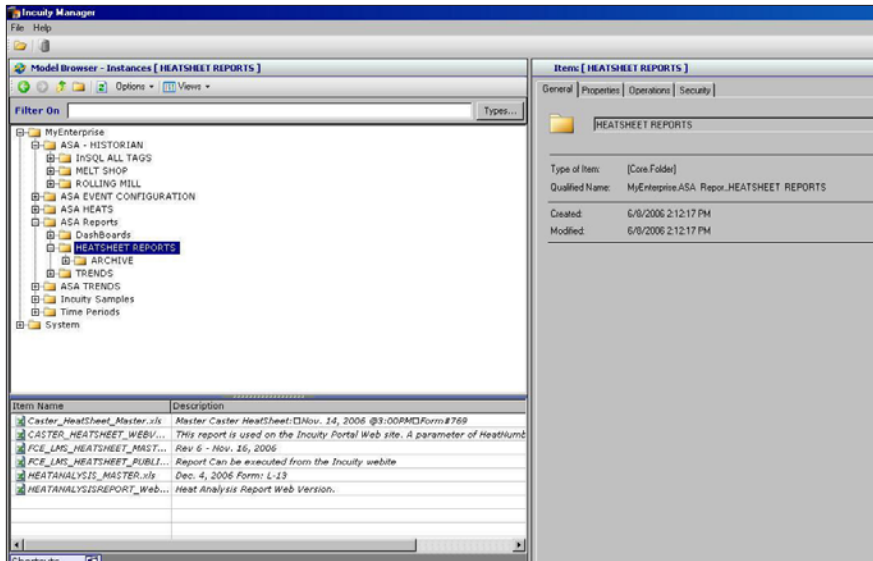
## Background

Arkansas Steel Associates LLC is a leading producer of railroad tie plates for the U.S., Canadian and Mexican markets, with growing service to railroads in the rest of the world. They currently produce as much as 150,000 tons of tie plate per year for the major markets, plus other products such as grader blades, wide flats and semi-finished products for the global railroad industry.

Although the plant is actually several decades old, Arkansas Steel Associates has accelerated their growth and modernized their operations considerably since the company's acquisition in 1989 by Sumitomo Corporation and Yamato Kogyo Company, Ltd., of Japan. This includes the addition of a 50-ton per hour automated electric arc furnace, a 3,000 horsepower breakdown mill, new walking beam reheat furnace, transfer tables and three vertical mills with associated conveyors and equipment.

In addition to plant upgrades, Arkansas Steel also made major improvements to both plant control systems and enterprise computing applications. They upgraded the human-machine interface (HMI) systems and added Wonderware IndustrialSQL Server databases for collecting all process data from the furnace and caster systems. The ActiveFactory toolset was deployed to provide better data analysis and reporting capabilities for the production people, and the laboratory information management system (LIMS) and oxygen and carbon analyzer were integrated to provide better data analysis.

LISTEN.  
THINK.  
SOLVE.™



The UPM shows a logical view of steel production operations.

As valuable as these upgrades were, perhaps the biggest strategic objective was facilitating compliance with the ISO 9000 standard for product quality. Arkansas Steel wanted to create a manufacturing intelligence system that would allow them to:

- Do more with the information already in the manufacturing and business systems;
- Provide more aggregated high-level information to management via dashboards;
- Provide the engineers and quality staffs with new tools to analyze the raw data and put it in better context for the users;
- Reduce the complexity of these systems so they are easier to use;
- Eliminate the need to install client copies of software on individual PCs around the company by deploying a server-based, service-oriented architecture.

In 2006 Arkansas Steel adopted the FactoryTalk VantagePoint enterprise manufacturing intelligence (EMI) software to expand their ability to gather information from multiple different data sources to analyze and manipulate it better and to share the resulting information with any users in the company. Like most other manufacturing companies, the production information at Arkansas Steel was fragmented, residing in multiple different systems and making it difficult for people to find, access, correlate and interpret data to make timely and good decisions.

A single server package was installed in June of 2006 that was linked to the IndustrialSQL Server historian and had connectors to the Arkansas Steel LIMS system and furnace, caster and ladle metallurgy control systems (LMS). The users on the plant floor and in the management offices can now review whatever information they want, from any of those data sources, by viewing information in customizable portal dashboards.

## Gaining Insight Into Production Operations

FactoryTalk VantagePoint provides services for Arkansas Steel that are the foundation of several newly implemented systems. These include collection services that gather data from both real-time production systems and business applications; information services that integrate and manage the information; and presentation services that provide insight to all end users.

FactoryTalk VantagePoint manages the data and their relationships in a Unified Production Model (UPM) to present a unified view of all data that is available and to abstract the

specifics of where it comes from and where it is stored. Analysis services then can correlate transaction data with time-series data and calculate, transform, summarize and aggregate it for analysis. The presentation services include tools for making the best use of information, including trend and X-Y plotting applications, an Excel add-in for analysis and reporting, and the FactoryTalk VantagePoint Portal, which provides web reports and applications to users. In addition, security services manage users, roles and their access to data.

Perhaps the most important application was the automated heat sheet systems for the furnace, caster and LMS operations. This has replaced manual systems that literally were handwritten reports on what ingredients went into each batch of steel and the details on how each batch was processed. While all the information was contained on each heat sheet, it was difficult to make good use of that data for guaranteeing product quality from batch to batch and for improving the process consistency when creating batches to meet particular customer specifications. FactoryTalk VantagePoint allows Arkansas Steel to better monitor processes from furnace to LMS to caster.

At the furnace, data is collected and stored in IndustrialSQL Server on power levels, oxygen inputs, natural gas inputs, water-cooling flows and other analog variables, plus the many discrete inputs that tell operators the furnace status. Operator inputs are also gathered on manual additions of chemistries and alloys being put into the steel. All of this information is used to generate the electronic heat sheets that provide comprehensive knowledge of what went into a batch of steel and how it was processed from start to finish.

At the LMS station, the system captures all data on what happens to the molten steel batch as it is transported from the furnace to the caster. At the caster, the primary

concerns are casting speed, water temperatures and flows, plus spot temperatures taken of the steel in the tundish to optimize it for casting. All of this data is also captured in the heat sheets. In addition, the maintenance staff can monitor what occurs within the furnace, the LMS and the caster during each cycle. They monitor panel temperatures, hydraulic pressures and other data items for faults and are alerted if equipment problems occur or if they are approaching a routine preventive maintenance point.

## From Insight Comes Agility

This application has been a success because it provides greater insight into the Arkansas Steel process operations.

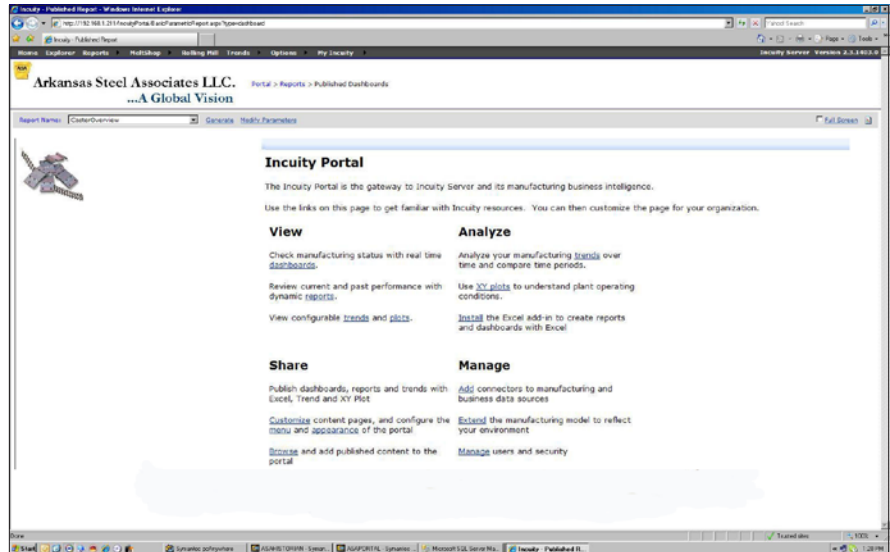
They are now able to deal with each heat as a batch and no longer have to use paper or electronic heat sheets. They are able to expose each batch as a time period in the production model so all the information is available in one place and users can drag and drop objects onto trends and into reports. They can also be viewed in management dashboards within the portal, right on their desktops.

All of this has allowed Arkansas Steel to move forward more quickly with their ISO 9000 compliance program, since it allows them to better monitor the specific chemistries involved in producing each customer's steel batches. It also helps them maintain more consistent product quality since they can now easily compare specifications as each batch moves through the process. Arkansas Steel can better utilize their LIMS data for enhanced quality control, to match test results with production data and track progress on what they planned to make versus what was actually made.

A recent application development has been the addition of a Windows-based statistical process control (SPC) system to gather specific data on how production operations are meeting tight customer specifications for steel tie plates.

The goal was to improve ISO 9000 compliance by providing proof of quality production specs in formal reports and trends that can be provided to customers.

There was only one catch, however. To turn all that data into meaningful information, in easy-to-create and shared reports that could be used by Arkansas Steel and its customers, would have required a large expenditure on web reporting software modules from the SPC supplier and new software licenses for ASA personnel who needed to use the reports. The problem was solved simply by adding another dimension to the EMI solutions. Since FactoryTalk VantagePoint can connect to virtually any data source, the Rockwell Automation Professional Services



All EMI activities start from the opening Portal page.

group created a new database connector that linked to the SPC application for gathering data from it. Existing user licenses of FactoryTalk VantagePoint allowed the necessary people to monitor the SPC results and report on them. Modifications to the production model,

The production model, which provides the logical description of the operations, was also modified to expand it with quality variables that correlate to tags in the SPC system and specify where this data would be accessed. Arkansas Steel then created a custom report for the SPC results – all as just another EMI application.

The end result is an Excel report and a FactoryTalk VantagePoint trend that is available to any authorized user on the ASA network or via the Internet.

Plant management has always been serious about analyzing production data and using it to drill down into processes for optimization purposes. Arkansas Steel assigned a form record number within the ISO 9000 system and now incorporate the SPC report in their existing report. Each report includes a form ID, the date, a revision level and approval designation. This is a legal document that may be provided to a customer that verifies that their specs were met and the reports can be shared for access via standard browser software.

Arkansas Steel also uses the higher-level FactoryTalk VantagePoint analytical tools, such as the X-Y plotter, to gain greater insight into their operations and facilitate even more sophisticated tracking and management of batch quality.

For example, using the X-Y plotter helps them correlate billet length with temperature to better identify defects; match heat number with average temperature or total tons produced; and measure average tons produced against power consumed. They will also develop a variety of new applications for specific uses, such as a downtime tracking



The caster dashboard provides an instant status overview.

application that will let Arkansas Steel make the most efficient use of their maintenance staff and keep production equipment running at the highest possible availability.

Analyses like these can help Arkansas Steel achieve more consistently high-quality product while increasing the throughput to serve higher customer volume, and all while making the most efficient use of their plant, equipment and people.

Finally, FactoryTalk VantagePoint will help Arkansas Steel access data from their ERP system and integrate it with the plant floor data. This will allow them to integrate their order system with production planning so that they are optimizing steel batch runs by correlating recipe changes with actual operation of the furnace, LMS and caster systems.

This can be an important improvement because Arkansas Steel produces custom steels that are not available from many other mills, such as high-grade carbon steel and boron steel. The ability to streamline production by making batch changeovers more efficiently can be valuable.

FactoryTalk VantagePoint is playing a key role in the complete integration of all Arkansas Steel operations, including the rolling mill, because of the insight it provides for people at all levels in the company.

FactoryTalk VantagePoint is a trademark of Rockwell Automation Inc. All other trademarks or registered trademarks are the property of their respective owners.

**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

**Power, Control and Information Solutions Headquarters**

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
 Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640  
 Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846