

VALUE PROPOSITION

STEEL

SOLUTIONS

Rockwell Software® RSBizWare™ PlantMetrics™

- Software package essential for performance improvement, scheduling, compliance and data acquisition

Rockwell Software FactoryTalk® Data Model

- Powerful database to manage and store production data

RESULTS

Automatic Logging

- Events are logged automatically, saving each supervisor up to an hour on each shift of entering data

Enhanced Monitoring

- Simplifies operator interface and reduces hand-written paper trails
- Displays delays in real-time, allowing plant floor personnel to enter details immediately and accurately
- Increases overall equipment effectiveness (OEE) throughout the plant

STEEL MILL GETS PERFORMANCE IN A PORTAL

WEB PORTAL-BASED MANUFACTURING EXECUTION SYSTEM (MES) SOLUTION FROM ROCKWELL AUTOMATION PROVIDES SMORGON STEEL WITH A NEW SET OF EYES FOR PLANT PERFORMANCE MONITORING, EXTRA SET OF HANDS FOR PLANT FLOOR PERSONNEL



Rockwell Software® FactoryTalk™ Data Model enabled Smorgon Steel to efficiently store and access production data.

BACKGROUND

Performance, in a nutshell, is manufacturing's bottom line. But how is it measured and defined? Optimization of plant performance—manifested as throughput, product quality, machine availability and efficiency—is only truly achievable if the base data are available in the first place. Accurate acquisition and analysis of this operational data—in real time—becomes the primary challenge.

Smorgon Steel conceived the need to improve performance analysis techniques at its Victorian North Laverton manufacturing facility. Manufacturing assorted hot-rolled steel rod and bar products to fulfill specific customer demands, the company depends on optimizing its schedule to minimize product changeover downtime, and hot-rolling billets with “nose to tail” as close as possible. Performance—and to some degree profit—is ultimately measured by the raw “prime tonnes” and percent yield of product per shift.



With the MES solution from Rockwell Automation, Smorgon Steel was able to calculate the ultimate key point of plant health, overall equipment effectiveness (OEE).

CHALLENGE

Keeping track of Smorgon Steel's dynamic production schedule and whether its production objectives are met is essential. For inclusion in the end-of-shift "production report," all downtime is logged, prime yield tallied, product types recorded and rolling efficiency calculated. Smorgon Steel management uses this data to assess mill performance and identify immediate opportunities for performance improvements.

The day-to-day production scheduling, inventory tracking, customer orders and logistics for Smorgon Steel's Laverton rod and bar mills are handled by an existing enterprise resource planning (ERP) system. Every steel billet cast by one of the company's four continuous casting strands is stamped with a "heat" number that identifies its exact grade or composition. All billets with the same heat number are progressively charged into the furnace prior to being hot-rolled into different

rod or bar sections of varying dimensions. It is imperative that changes in heat numbers are clearly logged into the ERP system, which the production tallies are also entered in as they come off the line.

"We were using a Microsoft® Access database to store all production data, which was extracted manually from the ERP system," says Pearse. "The shift supervisor would also have to type in all production delays as reported by the operators, who were recording these manually. From this he would generate the production report for that shift."

One of the main goals in introducing a new MES was to make the performance data more widely available to the operations management team, and presented in a way that made analysis quick, easy and flexible. The other objective was to automatically log production downtime to gain a more accurate idea of machine performance, while at the

same time allowing the operators to focus more on actually running the plant.

SOLUTION

After preliminary discussions with the Rockwell Automation engineering group, Smorgon Steel agreed to trial the Rockwell Software® RSBizWare™ suite of modular, scalable MES solutions in early 2002.

"We provided some computers and Rockwell Automation set up a pilot system, which we ran in the background for about six months," says Pearse. "When we were satisfied that the system was logging events correctly, we put a basic system into production and got the operators involved."

The first phase of the RSBizWare MES solution used the RSSql™ industrial transaction manager software, in combination with RSLinx® communications interface software, to retrieve real-time information from the plant-floor PLCs. The RSBizWare application's powerful structured database—the Rockwell Software FactoryTalk® Data Model (FTDM)—will replace the Access database used to store production data.

"The FactoryTalk Data Model is an open documented system, which means it's easy to interface with other software systems," says Cahill. "This is what allowed Smorgon to interface it with their existing SCADA. We can put it over the top of any SCADA system, which makes it very flexible. In this case, the operators are working from the same location as they always have—for all they know, it's just another SCADA screen."

In addition to the most common "shift

report" and "downtime report" screens, the portal allows new data analysis flexibility.

"The portal gives us functionality from any PC on site," says Pearse. "We can generate reports with just the click of a button; plus we can manipulate the data using Microsoft Excel® PivotTables®. It allows us to monitor the performance of the mills on a per day or per shift basis, which helps us identify where our major issues are."

According to Pearse, an interesting revelation has been the apparent increase in delays since automatic event logging began.

"It has made us realize how difficult it has been for the operators to accurately record these events," he says. "In some cases, recurring short delays (of say, one or two minutes) have been revealed where before they may have been overlooked. These might indicate a difficult product or they might indicate a problem that could accumulate into something more serious. Now that RSBizWare logs everything in real-time, we can investigate anything that looks suspicious."

RESULTS

Whereas the operators previously logged delays manually—and often inaccurately—the RSBizWare PlantMetrics™ component of the MES now automatically logs delays to the fraction of a second. On the occasion of such an event, operators are presented with an RSBizWare screen embedded within the existing SCADA for each mill; this allows them to enter details about the delay from drop-down menus.

"RSBizWare has given Smorgon Steel a tool for tracking uptime as well as downtime," says Cahill. "They never really tracked uptime before. Now they can track what they produce during operation, and whether that tallies with the expected rate of throughput, in the same system that tracks why the machine is stopped."

This level of tracking is required to calculate the ultimate key point indicator of plant health: overall equipment effectiveness (OEE). A function of percent availability, throughput performance and quality, OEE is a compounded formula that identifies how well the plant is performing.

If the RSBizWare MES has given Smorgon Steel a new set of eyes with which to monitor performance of the mills; it has also given the company an extra set of hands. The automatic logging of events alone is saving each supervisor up to an hour per shift in entering in the data. Both they and the operators can now apply themselves to running the plant instead of getting buried in paperwork. Once the ERP data is automatically transferred, the manpower efficiency is likely to increase another degree.

Smorgon Steel's performance bottom line is now on track. And, although it may take some time for the data accumulated by the MES to reveal all their hidden uses, the potential for early identification of operational inefficiencies is already apparent. As the management team grows used to having plant performance in a portal, the empowerment can only grow.

The results mentioned above are specific to Smorgon Steel's use of Rockwell Automation products in conjunction with other products. Specific results may vary for other customers.

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