

Industry: Food & Beverage

Coca-Cola Fortune (Pty) Ltd.

www.cocacolafortune.co.za



“The plant now has real-time visibility across processes and equipment and a much higher level of operational data integrity, while being nearly paperless.”

Danie Tredoux,
Division Project Manager, Coca-Cola Fortune

A refreshing look at business for Coca-Cola Fortune

by Wonderware Southern Africa

Goals:

- To achieve the lowest unit cost in Coca-Cola Fortune and also to establish a number of new best practices for Coca-Cola Fortune and Coca-Cola SABCO;
- To achieve the highest labour productivity and plant efficiency (OEE) as well as lowest energy cost and water usage.

Challenges:

- Integration with non-OMAC compliant OEM equipment;
- Tight time constraints;
- A tight budget;
- Integration with Coca-Cola Fortune's IT infrastructure.

Wonderware Solution:

- ActiveFactory software;
- InTouch HMI;
- Wonderware Operations software;
- Wonderware Performance software;
- Wonderware System Platform.

Results:

- Coca-Cola Fortune's Bloemfontein plant now has a nearly paperless environment that will reduce administrative load and that, together with better management information, will drive efficiency up and costs down;
- The plant now has great visibility into its equipment and process performance as well as a high level of process and information integrity.

Port-Elizabeth, South Africa - Coca-Cola Fortune is one of 4 Coca-Cola licensed bottlers operating in South Africa. The plant is located in Bloemfontein. Coca-Cola Fortune is responsible for approximately 23% of the total SA Coke and related product sales. The business is expected to sell 7.5 million hectoliters or 66 million cases of beverage in 2009, utilizing 14 production lines.

Coca-Cola Fortune is part of the Coca-Cola SABCO business entity which is licensed by Coca-Cola to bottle in 12 different African and Asian countries. Coca-Cola SABCO, with the Group Office in Port Elizabeth, has an excellent reputation for product quality and bottling excellence.

Whatever its financial position, the world can still enjoy a Coke and the company responsible for more than 20% of South Africa’s enjoyment of Coca-Cola and hundreds of other refreshing products is Coca-Cola Fortune, part of the Coca-Cola SABCO group.

With an annual production of 7.5 million hectolitres across 344 products and 14 production lines, Coca-Cola SABCO looked to a Manufacturing Enterprise Solution (MES) system from Wonderware to manage complexity, improve efficiency and reduce costs at its Bloemfontein facility.

Coca-Cola Fortune Cheetah plant in Bloemfontein is the first plant in Coca-Cola Fortune to implement a MES system. Apart from the usual extensive MES functionality, the system was chiefly to focus on

batch tracking, line performance, operations management and Overall Equipment Effectiveness (OEE) functionality. This was a Greenfield plant that could capitalise on available technologies while the rest of the group used mostly manual or semi-automatic systems.

Business Objective

“The objective with the Cheetah plant was to achieve the lowest unit cost in Coca-Cola Fortune and also to establish a number of new best practices for Coca-Cola Fortune and Coca-Cola SABCO,” says Ryan van Kerkhof, Manufacturing Unit Manager, Cheetah Plant. *“Key goals included highest labour productivity and plant efficiency (OEE) as well as lowest energy cost and water usage to name a few.”*

In order to achieve these business objectives, Cheetah plant needed easy-to-use operator interfaces, data analysis facilities, a ready link to ERP systems (specifically SAP), product traceability, plant visibility, the automation of bottling processes, remote access for support and query and in-plant information display.

Two of the notable aspects of the project were the level of customer cooperation during its design phase and the enthusiasm of the operational staff who showed huge interest in its implementation.

Solution Selection

EOH Mining and Manufacturing, a Wonderware system integrator, was selected because of the company’s semi-independent nature and its track record in the same industry and accumulated industry knowledge.

The software included Wonderware’s range of industrial automation and MES solutions. It was a perfect fit because the adjacent plant was already using Wonderware software solution for downtime analysis and it was also decided that the Wonderware offerings provided the required functionality.

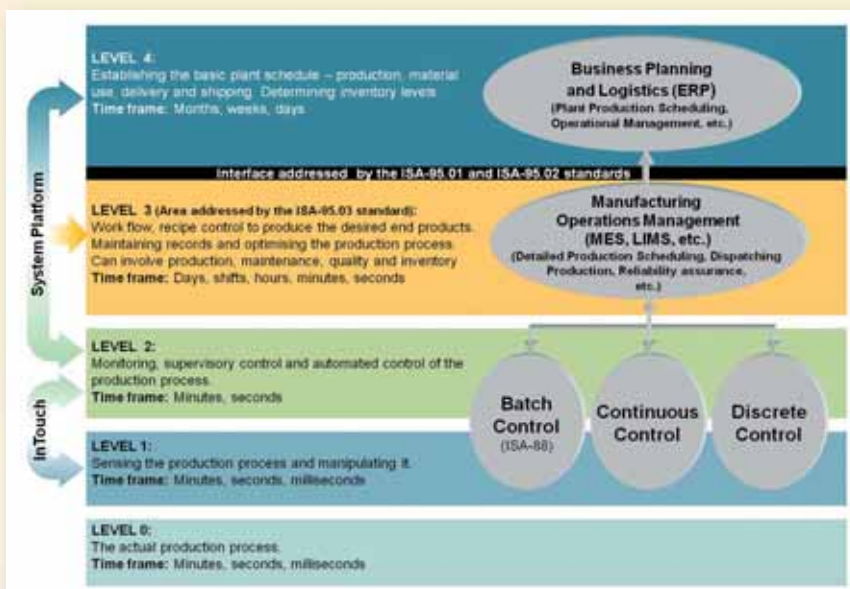


Figure 1: Multi-level hierarchy of activities in a manufacturing enterprise.

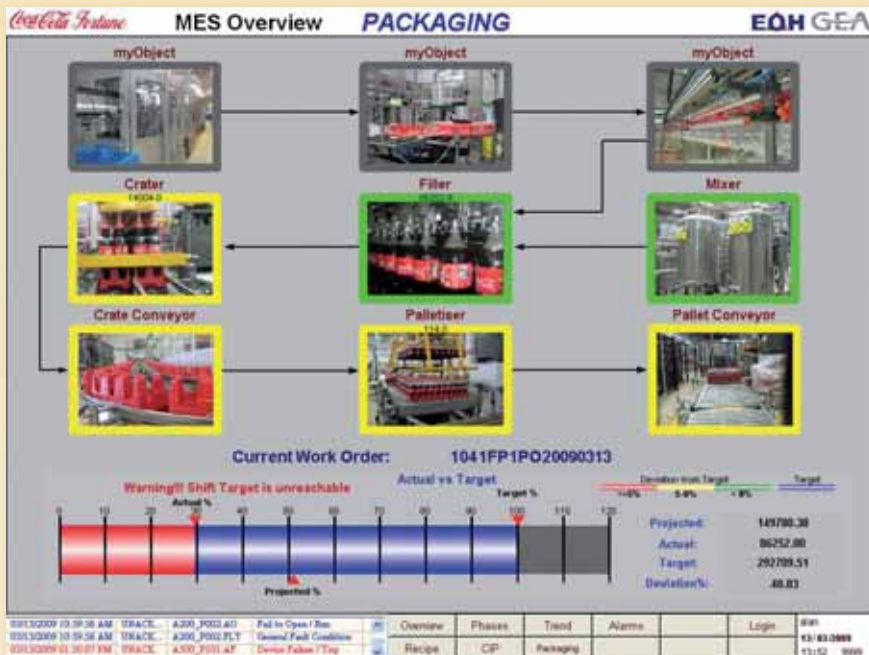


Figure 2: MES system overview at Coca-Cola Fortune, Bloemfontein.

System Architecture

The system architecture consists of the full Wonderware suite of products. In level 0, Siemens PLCs control the plant. In levels 1 and 2, the Wonderware System Platform provides the infrastructure on which Wonderware InTouch HMI (Human Machine Interface), Wonderware Operations software and Wonderware Performance software (level 3) are implemented while also providing integration between levels 2 and 4 (figure 1).

The Wonderware products in use are based on ArchestrA technology which provided the core infrastructure for the rest of the Wonderware Operations software and Wonderware Performance software. InTouch HMI is used as a universal workstation which provides process plant control and visualisation into the MES operations and the packaging line performance. The universal workstation concept allows InTouch HMI applications for three different vendors to be integrated into a single environment in order to provide a unified view into the entire plant.

In excess of 20,000 tags are processed. There are two universal workstations with large LCD screens used for displaying line performance KPIs. The operational staff can control the plant as well as view historical process information and plant

operational information such as product genealogy. Line performance (performance, availability and quality) is monitored with OEE on some equipment whereas only the availability parameter is measured on the rest.

ISA-88 and ISA-95 standards were extensively used in the development of the process control and equipment models. The information from the production line was converted for visualisation using an OMAC / PackML standard.

Of the extensive MES functionality available, production execution, inventory control, traceability,

genealogy, quality states and yield control were implemented. "The ISA-95 activity models were used to define the production, inventory and quality requirements," says Barnard. "The MES software provided the basis for the business logic and reporting functionality while the Graphical User Interface (GUI) was implemented using InTouch HMI in its role as a universal workstation. As the system requires minimal input from the operational staff to initiate and control production processes, some of the business logic transactions were implemented using custom ArchestrA objects." (ArchestrA is Wonderware technology backbone for all industrial, MES and ERP connectivity applications).

The system is integrated with the company intranet on the reporting level, allowing multiple users to access production and line performance information using out-of-the-box reporting tools. Wonderware ActiveFactory software (trending, analysis and reporting software) and Wonderware Information Server (aggregation and presentation of plant production and performance data over the web or company intranet) are used. The ActiveFactory software provides access to production process control information while Wonderware Information Server provides access to plant operation information. "The result of all this is that operational staff has full access to real time and historical plant information," adds Barnard. "From a system integrator's point of view, perhaps the most outstanding feature of

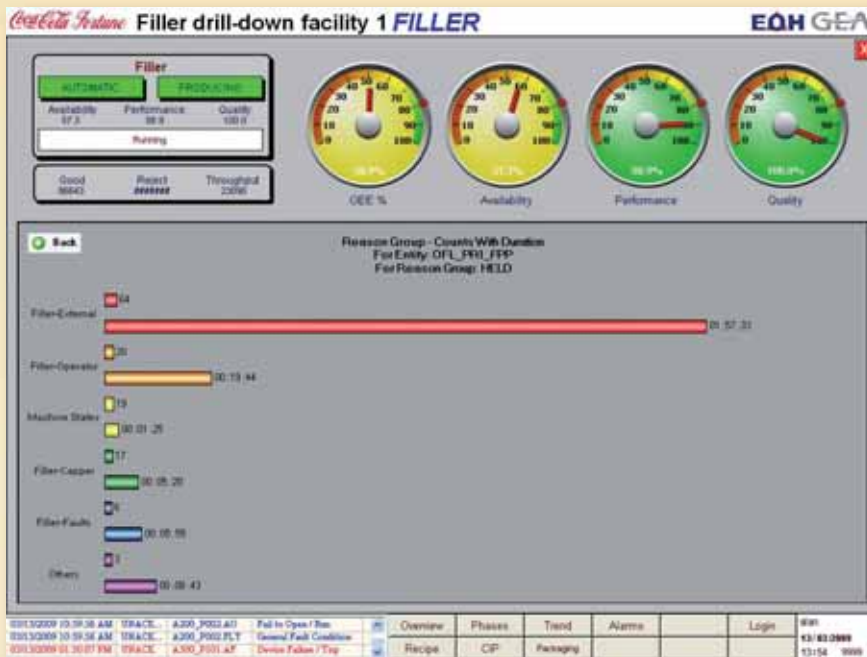


Figure 3: OEE dashboard for a filler showing drill-down capability to pinpoint the reason for non-performance.

the system is the ease with which applications, supplied by different vendors using the same standards and platform, could be integrated.”

System Implementation

Implementation started in December 2008 with a targeted sign-off date of end March 2009. The project was preceded by a URS development phase where the customer’s project team was enlisted to develop the URS by applying the full ISA-95 standard in mapping Coca-Cola Fortune’s MES requirements.

“Some of the challenges that were thrown our way were the integration with non-OMAC compliant OEM equipment, time constraints, a tight budget and integration with Coca-Cola Fortune’s IT infrastructure,” says Barnard. *“The whole system had to be developed, tested and implemented live and offline development was done using VMWare technology with a simulation engine to provide the relevant data.”*

According to Barnard, use of the ISA-95 standard provided an excellent framework for defining the MES requirements and working closely with the customer’s outsourced IT division ensured that all internal policies were adhered to with respect to the installation of network infrastructure, switches and fire-walls. *“Something else that helped was the use of a unified standard on the Wonderware System Platform and visualisation system which ensured ease of integration and a unified HMI experience for the operational personnel,”* says Barnard.

Benefits

- Coca-Cola Fortune’s Bloemfontein plant now has a nearly paperless environment that will reduce administrative load and that, together with better management information, will drive efficiency up and costs down;
- The plant now has great visibility into its equipment and process performance as well as a high level of process and information integrity.

Conclusion

By reconciling business needs with production realities, MES is the ‘information switchboard’ for a manufacturing or mining company. Where business processes are interested in financial and customer issues and the shop floor is interested in production and technical issues, MES handles the information in which the entire company is interested. And, as shown at this plant, by dealing with facts in real-time, MES can’t ‘fudge the books’ and provides the right kind of decision support information to the right people at the right time.

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