



# Case Study

Improving data collection and shopfloor performance were the key elements in the renewal and upgrade of a major brewer's production system



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# A Satisfying Brew

## Background

One of Astec Solutions' landmark projects in the past five years was for Molson Coors Brewing Company (UK) at their headquarters in Burton on Trent, Staffordshire. Molson Coors is a large multinational brewer, with operations in North America and across the world. The British operation has multiple filling and packing lines for cans, bottles and kegs, with high-speed canning lines capable of filling up to 2000 units per minute. The parent company was engaged in a global drive for efficiency in its operations, in order to maximise asset utilisation and performance.

The packaging business unit at the UK site had very limited MES (Manufacturing Execution System) functionality and made use of a home grown, custom downtime data capture system. This had increased in size over a number of years on an ad-hoc basis and was no longer meeting the needs of the business. Visibility and the quality of efficiency data for the entire packaging operation was limited and could not provide data in the format used by other sites globally.

Packaging production orders, issued by the aging 'green screen' MRP (Materials Resource Planning) system, were managed, fulfilled and reported on manually. This MRP system was to be replaced by SAP, with the final stages of the SAP implementation taking place during our MES project.

Astec's challenge was to implement a system to help drive the continuous improvement program, with a focus on maintaining and improving the efficiency of the packaging lines.



The requirement was to seamlessly upgrade the existing efficiency system and implement the new MES with minimum disruption to the production process, while also supporting the change of MRP. The MES project was very much functioning as the enabler solution to drive data in to and out of the newly-installed SAP system.



## Analysis, prognosis, prescription

Astec was tasked to deliver a system which used many of the existing approaches for data collection and plant modelling already proven in a number of North American production sites. Newly acquired sites elsewhere in Europe were also considered, while meeting the efficiency and production reporting and analysis criteria required by the UK.

Molson Coors were looking for a low risk, product based solution, so a clear mandate was provided to ensure the system used globally available and supportable COTS (Commercial Off The Shelf) software, which required little or no custom software development.

Astec regularly utilises a broad network of partners across the globe who are often able to provide valuable resources to accelerate project delivery. In this instance, one of GE's key North American Solution Providers were able to support the project. This followed their close involvement with Molson Coors' MES development throughout Canada and the USA over many years prior to the Astec project.

"Close working relationships with our partners are a crucial part of the service we offer," comments Andy Tripp, Managing Director of Astec Solutions. "This project is a perfect example of how using combined skills and knowledge avoided a potentially lengthy and complex detective task."

With both system integrators working as one, a global reach was provided, mitigating the risks often associated with projects influenced by people and sites in different territories.

The packaging lines comprised equipment of varying ages and configurations with a range of different PLCs (Programmable Logic Controllers). The key efficiency KPIs delivered by the system similar to OEE (Operational Equipment Effectiveness), and focused on enabling the system to evaluate the status of each machine within each packaging line correctly; whether it was working, and if not, why not. The management team at Molson Coors wanted to gain insight to enable them to undertake root cause analysis.

In terms of efficiency, the approach was taken to automatically gain the reasons for machine stoppages from the existing automation system, working alongside all production personnel to gain additional, more granular causal insight. The main areas of focus included the filling machines, pasteurisers, case packers, conveyors and wrappers. The filler is presented as the line's rate limiting machine so, for the purposes of maintaining efficiency, it is essential that unfilled containers arrive at the maximum rate of the filling machine and that downstream activities such as shrink-wrap, labelling, cardboard packaging and palletising are able to operate at least as fast as the output from the filler.

With packaging components such as cans, bottles, caps, labels and cartons not being manufactured in-house, monitoring and control of delivery order dates, volumes and lead times was essential to avoid unnecessary overstocking. At a throughput of 2,000 units per minute, operations are high pressure and complex. The financial and customer relationship implications of delaying production on this scale, particularly in the filling area, are serious and escalate quickly. The Astec partnership was able to provide a system that could identify faults and quickly communicate these to operators for remedy and team leaders for improvement.

The new system was tailored to provide the appropriate information and KPIs applicable to the UK operation. During the 18 month project term, Molson Coors' global operations expanded, with a significant increase in the number of European sites. This put even greater emphasis on the importance of aligning KPI measurement, ensuring performance across all sites could be measured consistently.

## Solution and implementation

As a UK Premier Solution Partner for market leader GE Digital (formally GE Intelligent Platforms), Astec was ideally placed to implement the required solution using GE's commercial off-the-shelf production automation software. Molson Coors had familiarity with the GE Intelligent Platforms' software stack and were already using the Historian and SCADA products on-site, with the MES product set being used in their North American facilities. The hardware for the new system came in the form of virtual servers and thin clients supported by Hewlett Packard.



- **Automated knowledge capture:** Unlike mere data capture, knowledge capture includes detail for useful interpretation. For example, while the system can capture the fact an emergency stop has occurred it will also capture the source of the emergency stop (e.g. "Guard Door Opened") and prompt the operator to enter a reason for their intervention. This enables effective route cause analysis and rapid implementation of change and improvement rather than simple alarm capture.
- **Improved reporting:** The Historian feeds information into the Proficy Plant Applications MES software, which makes it available as contextualised data using the detailed plant model. The context rich data is then provided to the reporting system which made use of standard Microsoft components (Microsoft SharePoint with SQL Server Reporting Services (SSRS) embedded) providing a supportable analysis environment. Astec provided a suite of packaging reporting functions providing views on the business area, specific packaging lines and individual machines.





- **Robust planning:** With production figures being reported directly to SAP in real-time and work orders for the current week being visible to the packaging operators for selection, the adherence to plan (or schedule adherence) can be correctly reported and monitored to ensure customer fulfilment. Final production counts are attributed to the correct work order and tighter control of raw materials and components is achieved.
- **Improved visibility:** The packaging lines at the Burton site are extensive – often 100 yards long. To minimise walking time, improve visibility and accelerate fault diagnosis and correction, Astec installed user interfaces at multiple locations along each line. This provided Molson Coors with a powerful tool which allowed operators to take ownership, which in turn, helped to raise efficiency.
- **Improved functionality:** Astec worked closely with the customer throughout the project to design and implement intuitive “reason trees” which enabled the efficient recording of downtime. This ensured efficiency KPIs were defined and monitored correctly and incorporated within management reports in the right way.
- **Adaptability:** Thin client workstations running standard Remote Desktops enable fully featured client stations without the ongoing support overhead of local PC installations. A small number of Remote Desktop Services servers can provide a resilient client infrastructure. The implementation of ACP's Thin Manager simplified the ongoing management of the low cost, HP Thin Client devices.
- **Change Management:** Astec engineers assisted the internal team with change management such as training issues to ensure smooth implementation.

## Outcomes

The system at Molson Coors was successfully implemented with minimum disruption to production. Efficiency data can now be easily and rapidly accessed, allowing the system to be used to fault find right down to the level of individual machines or across entire production areas, providing a framework for a full range of continuous improvement and efficiency drives. It also delivers the information the SAP system needs in order to function, including data and information required to understand capacity planning and forecasting.

Each filler is followed by a measuring device which checks the filled unit has been filled to the right level. Used as a vital compliance tool, the system ensures the contents of the packages are as described, protecting the company's consumer reputation while, at the same time, checking product is not being given away.

The system provides a single source of information for past production, the current production plan, product specifications and quality check points as well as efficiency metrics spanning products, machines, production areas and even teams. This enables comparisons to be made across teams, sites, product types and packaging lines, so issues that could potentially harm profitability can be identified.

The project was a substantial investment and represented a marked step change, transforming business processes and operations.



## Background

Astec Solutions uses best in class industrial software to deliver Smart Manufacturing Solutions into manufacturing and other industrial sectors.

The core capabilities of the business include provision of Industrial IoT, MES/MOM, SCADA, Batch Execution, Workflow and reporting solutions, supplemented by a dedicated support desk and field service team. Astec works seamlessly with clients' Engineering and IT departments to ensure all monitoring, control, visualisation and analytical systems make best use of existing infrastructure investments – while providing simple, effective and highly available solutions which can be used for many years.

## Further Information

For further information relating to this case study please contact:-

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