



Manufacturing

Food and Beverage

Pressureless Conveyor Control and Singuliser Modular Control

Client Tooheys Brewery (Lion)

Location Sydney, Australia

Value \$500,000

Duration October 2011



Finalist 2012 Process and Control Engineering (PACE) Zenith Awards Food and Beverage category

Project Overview

Tooheys is one of the best known brands in the Australian beverage market.

The challenges faced by Tooheys are the same as those faced by all Australian manufacturers in the current economic climate – how to increase the efficiency of existing plant and equipment to remain competitive?

Tooheys approached SAGE Automation for help.

Tooheys had identified several major factors affecting the efficiency of their bottling line. The biggest of these was "crowding" and collision of bottles on the conveyor, resulting in damaged and broken bottles. This adversely impacted on the operation in a number of ways:

- The bottling line may need to be stopped to clear broken glass, reducing total output.
- There are personnel safety issues around the handling of broken glass.
- The cost of broken and damaged bottles adds to the unit cost of production.

In addition, safety systems on the bottling line had not been reviewed for a number of years.

Project Highlights

SAGE engineers suggested two major innovations to the bottle handling process: Pressureless Conveyor Control and Singuliser Modular Control. Pressureless Conveyor Control (PCC) ensures that bottles are not forced up against each other on the conveyor system, leading to "zero-pressure" operation that is familiar in traditional materials handling applications. Singuliser Modular Control (SMC) is a process that closes gaps between bottles on the conveyor, which is critical when feeding bottles into process equipment since gaps produce stoppages. The SMC process involves continuously adjusting the speed of motors based on the measured distance between bottles on the conveyor.

The project commenced with a review of machine risk by SAGE. This review was used as a basis for the design of the safety system.

Tooheys chose to implement these process improvements on a new automation hardware platform, based on a Siemens S7 programmable logic controller (PLC) system with a Profibus DP network for process communications and an AS-Interface network to implement a Category 4 safety system. A new iFix SCADA system would provide the operator interface

Project Outcomes

The impact of the new automation system was immediately apparent. Glass breakage due to bottle crowding has been virtually eliminated, increasing the availability of the bottling line and employee safety. In addition, the PCC and SMC **control strategies have contributed to a 20% increase in maximum system throughput**. The bottling machine is now able to run at its highest rated speed, maximising utilisation of the bottling line. The customer has also benefited in the area of engineering practice, with some SAGE engineering standards now being adopted by Tooheys as their site standards.

The automation system at Tooheys demonstrates the combination of skills required by modern Systems Integrators

The PCC and SMC technology implemented by SAGE on the bottling line has proved so successful that it is likely to be implemented in other areas of the plant.

Apart from electrical panel building and basic PLC and SCADA programming, SAGE was able to provide the client with:

- Process Engineering experience from the materials handling industry.
- Software Engineering expertise to design, implement and document PCC and SMC software for flexibility and re-use.
- Safety Engineering to analyse, design and implement complex machine safety systems.
- Professional, flexible and innovative Project Management to successfully deliver the project.

A key factor in the successful delivery of this project was the nature of the relationship between SAGE and Tooheys. On the factory floor, client/customer hierarchies were set aside, and all stakeholders collaborated as equal partners in a team with common goals. The resulting high performance of the project team would not have been possible without this collaborative mind-set.

"The team was under the pump from the word go, with the commissioning time falling on the start of our peak period. SAGE delivered the project originally planned out for two months in one on time, and on budget.

Sasha Petrovski, Lion Project Manager