

Expanding Capacity at Carlsberg-Tetley



Many companies recognise that simulation modelling can significantly reduce the risk associated with major change. A recent project at Carlsberg-Tetley's Northampton Brewery resulted in an envisaged requirement to install a third filter at a cost of £1m being avoided whilst the requirement to increase capacity by 33% was met. The best solution, identified through modelling, was not the obvious one.



"Simulating our Northampton Brewery has enabled us to prove that the required increase in capacity was realistic without a third filter costing £1m"
Pam Allen
IT Manager
Carlsberg - Tetley

Background

Carlsberg-Tetley was planning a 33% increase in the volume of lagers produced at the Northampton Brewery. The number of brew streams was to be expanded from two to four, with a substantial rise in the variety of lagers produced. It was also planned to increase both the volume and the variety of ales brought in by road to be packaged at Northampton. The final product range would more than double. Additionally the case for installing a second canning line was under review.

Carlsberg-Tetley recognised the need for capital investment to meet these new requirements. It was anticipated that a new Filter and several extra Bright Beer Tanks (BBTs) would be required. Because of the magnitude of the capital costs it was essential that the new equipment would deliver the level of benefit cited as the justification from the investment. Moreover, the increase in capacity needed to be achieved in the most economical way.

Company	● Carlsberg-Tetley Brewing Ltd
Industry	● Food & Drink
Application	● Capacity Planning
Benefit	● £1m cost avoidance

Whilst the brewing process is reasonably straightforward in isolation, the interactions between various stages are not always intuitive and are affected by the products produced. The behaviour of the overall process is a complex dynamic interaction between many factors including...

- physical constraints
- product constraints
- optional, fixed and preferred routing of brew streams
- different process times, and
- capacity of the groups of equipment and tanks.

This makes it extremely difficult to predict the impacts and benefits of making specific changes (both in isolation and in conjunction with each other). Determining the value of upgrading equipment and alleviating constraints to a certain extent may be 'a shot in the dark'; the risk inherent with change needed to be mitigated to provide all parties with the confidence to proceed.

Structure of Programme

Simulation modelling was identified as the best way to understand these uncertainties and to support Carlsberg-Tetley in producing a fully validated business plan for expanding the Northampton Brewery. Lanner Group had previously simulated the Leeds brewery and was able to demonstrate successes with other breweries.

Simulation's unique time based approach, in conjunction with the ability to reflect the factors that vary, enables models to accurately mimic the complexities of real life production systems. Simulating a process provides an invaluable insight into where inefficiencies and the true bottlenecks lie. Once the bottlenecks, or constraints, are identified, 'what-ifs' are performed in order to evaluate how best to improve performance through a series of specific changes.

To create the simulation model, Lanner and Carlsberg-Tetley each appointed a 'project leader'. Once the underlying logic defining the behaviour had been identified and agreed, model building commenced. The first step was to create an 'as is' model so that options for expansion could be compared with the existing configuration. Throughout the process much attention was paid to validating the model to ensure that an accurate representation of the process at Northampton had been produced.

Once the base model was complete and fully validated, a series of scenarios were tested. At the outset an extra Chiller was added at Centrifuging and the BBT manifold was upgraded to allow full flexibility through the BBTs. Each scenario was a variation on...

- Percentage increase in volume
- Optional addition of 3rd Filter
- Optional addition of new large BBTs
- Optional addition of new medium sized BBTs (various numbers were considered)

Following a comprehensive set of evaluations, the final recommendation was to retain the two existing filters and commission three new medium sized BBTs. This was the most cost-effective solution, offering high flexibility coupled with a high delivery success rate.

Benefits

Prior to the simulation, the favoured option included the addition of the third filter. The simulation demonstrated that the negligible increase in capacity did not justify such expense. **Avoidance of the initially favoured option saved an estimated £1m.**

The model results have been used to support the investment decision at Northampton, which includes the addition of a new Canning Line.

The total investment now approved exceeds £3m.

The model has been instrumental in evidencing the case for investment and is acknowledged as best practice.

