

North British Distillery was founded in 1885 by the inaugural chairman Andrew Usher who was referred to as 'the master blender'. First production in 1887 equated to 3.6 million litres of alcohol. Today, it is the largest whisky distillery in Scotland with the capability to produce 63 million litres of alcohol per annum. Approximately 20% of Scotland's grain whisky comes from this distillery.



Lean Team

Brian Watts – Production Manager
Gordon Lindsay – Engineering Supervisor
Frank McCafferty – Engineering Storeman
Douglas MacDonald – Production Controller
Gavin Arnott – Production Operator
Alison Dayer – Accounts Assistant

NBD Overall Objective

To involve a cross functional team in Lean Activities to start the process of creating a lean culture throughout.

Lean Project Objectives

Having looked at a number of areas, the team decided to focus their Lean project on 'yeast management' for the following reasons:

- Yeast is a major raw material cost
- There is a huge potential for losses of alcohol yield in the fermentation process due to yeast quality and this can have a negative knock on effect throughout the whole process
- Yeast management had been highlighted as a major area for improvement by the majority of employees attending pre-programme Lean workshops

Project problem/Muda statement

Infection in the fermentation process results in the loss of alcohol yield, downstream processing issues, reduced plant throughput and increased raw materials/energy costs. The overall cost is estimated to be thousands of pounds.

Lean tools utilised

- Process mapping – a colour coded map following the complete yeast process identified problems and breakdowns in the process providing a very visual tool for analysis

- 7 Lean Wastes – the team created a 7 waste checklist and applied this to the process map for deeper analysis
- Why-why analysis – the team utilised this form of analysis to get to the root cause of the issues
- 5S – the team created a 5S strategy to support the project and the wider implementation of Lean

Working through the analysis

The team developed the project with support from the following:

- Yeast supplier - a number of outstanding yeast plant technical issues were resolved and modified cleaning cycles introduced. Further advice on technical equipment was taken to reduce the time taken to carry out yeast quality analysis. Delivery date changes were made to allow improved delivery sampling.
- Instrumentation department – advice was provided on the feasibility of the Lean team's technical improvements.
- Laboratory department – assistance was provided for the analytical requirements and interpretation of data resulting in an improved service with more timely processing of samples.
- HSE department – provided information to measure the environmental impact of the project.
- Accounts department – financial information was provided to quantify the potential benefits upon conclusion of the project.

The team's investigations comprised of tracking historical and live issues providing information that could be analysed to reduce the impact of future infections. The detailed analysis highlighted many opportunities which needed to be addressed.

Addressing the issues

As the company improves the "yeast management process", implementation activity will concentrate on the following:

- improved yeast stock control linking usage to the purchasing process

- timely resetting flow meters for more accurate measurement and timings
- increased fermentation monitoring with the introduction of an electronic early warning system enabling proactive decision making, preventing waste
- Frost damage prevention measures (trace heating)
- reduced cleaning cycles, from 3hrs to 1hr per cycle
- updated work instructions leading to increasing process consistency and reducing potential damage to plant and equipment

Developing a Lean culture at North British Distillery

Throughout the programme, the team constantly communicated activities to ensure buy-in from all employees across the business. This has been instrumental in the development of a "Lean Thinking" culture.

Business Benefits

- Financial impact – the improvements being implemented will reduce costs by an estimated £50k – £100k per annum. This will be monitored going forward.
- Environmental impact - additional processing to compensate for loss in yield incurs both financial and environmental penalties. Additional electricity usage annually contributes to 60.1 tonnes CO2 with natural gas adding a further 42.7 tonnes CO2. Site water usage would also increase by over 1 million litres.

The future

The business is now committed to developing further teams having identified the following project areas: Engineering and stock control; Production Consumables; Permit to work; Stock control of pellets for the "Animal Feeds" plant; General problem solving across the business.

"The completion of this project has given us an appetite to use lean techniques and tools in everything we do"