

Case Study

Reduce energy costs

Project background

A large European group created and marketed valuable starches with unique properties that guarantee nutritional safety. Senior management were keen to optimise total cost of production and reduce environmental impact.

The largest consumer of energy was the evaporation unit.



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Problem

Management sought to reduce the energy consumption of a potato starch factory within the group. A review of business results showed excess energy cost in production. A Lean Six Sigma team was set up.

Pareto analysis highlighted that coagulation and evaporation were by far the biggest consumer of energy, costing \$6M per year, so they focused on reducing water usage.

They discovered that there was excess measurement error which exacerbated difficulties in analysing protein concentration in dried starch.

Dirt contamination in starch slurry was also variable and subject to measurement error. This also gave rise to difficulties in meeting moisture, protein, density, temperature, pH and chemical oxygen demand specifications.

The team focused on reviews of the extraction and counter current hydrocyclon starch/water refinery process in order to reduce waste water.

Solutions

The team also discovered that the cleaning process gave rise to air in the fluids which affected mass balance and water input calculations. They discontinued manual cleaning and implemented an automatic advanced cleaning process.

An improved measurement system was introduced, using data recorders connected to the control network. These were used for evaluation purposes and to ensure that process input specifications were met and that process input variations were reduced.

In order to maintain a reduced amount of wash water to the big column, the set point in the central control room was lowered.

Training on new standard operating procedures was provided to operators.

The focus of daily production meetings was altered to monitor process input parameters.

Business benefits

Wash water volumes were reduced by 13%. As a result energy costs were reduced yielding savings of \$525k per year.