

SUMMARY

Challenge

Increase production capacity of existing assets

Solution

Inferential moisture sensor, Model Predictive Control, Process Optimiser

Results

Increased yield, powder rate. Fast payback.

BUSINESS CHALLENGE

Abbott Nutrition operates plants in Europe, Singapore and North America. Each site has its own unique challenges, specific to the products they manufacture and the markets they serve.

One common factor is the desire to increase process capacity and capability - pushing existing plants closer to their constraints to maximise ROCE and OEE.

The project goal was to increase throughput and raise yield, without compromising the very high standards of product quality.

PERCEPTIVE SOLUTION – ADVANCED PROCESS CONTROL

There are several competing requirements in the manufacture of high-value nutritional powders: increasing run time to a safe maximum; reducing the energy and chemical costs of plant cleaning; consistently making product to the right specification with the minimum amount of waste.

First, we examined the key process units to determine where opportunities existed to enhance the operation. Then we developed robust models from process and quality data, to determine how much entitlement could be won and what strategies would be required. Finally, we implemented a suite of Advanced Automation tools:

- **Automated** start-up of evaporators, shortening the time to reach stable operation
- **Advanced control** of evaporators, to minimise the impact of process disturbances, reduce variability in evaporator outlet solids and increase mean solids going to the feed tanks
- **Optimised** scheduling, to better balance output from the evaporators with demand from the dryer
- **Minimise** disturbances caused by feed tank changes to avoid compromising product quality
- Deployment of **inferential 'soft' sensors** for real-time powder moisture estimation and control
- Calculate and **control dryer humidity** in real time to minimise impact on powder properties such as stickiness
- **Predictive control** of the spray dryers, maximising throughput while avoiding blockages
- **Automatically increase** powder rate, reduce variability in powder moisture, **increase yield**

RESULTS

The energy savings and improvements in yield were enough to return the initial investment **within 6 months**. However, once the plant was able to fully exploit a production capacity increase of **more than 8%**, the true **rate of return was measured in weeks**.

Since implementation, the client has commissioned an **operator training simulator**, to bring their new recruits up to speed more rapidly, while at the same time offering a valuable refresher to existing operators

“The Perceptive system is helping run the plants more efficiently and the support we get is excellent.”

Kevin Brady, Engineering Manager, Abbott