Rockwell Automation Pavilion8® Model Predictive Control

Overview

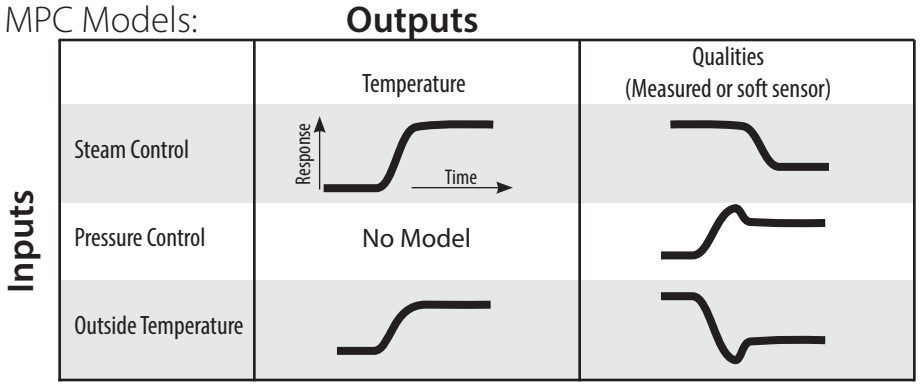
Rockwell Automation Model Predictive Control (MPC) Applications provide control and optimization of the process through patented, industry leading technology powered by Pavilion8®.

What is Model Predictive Control?

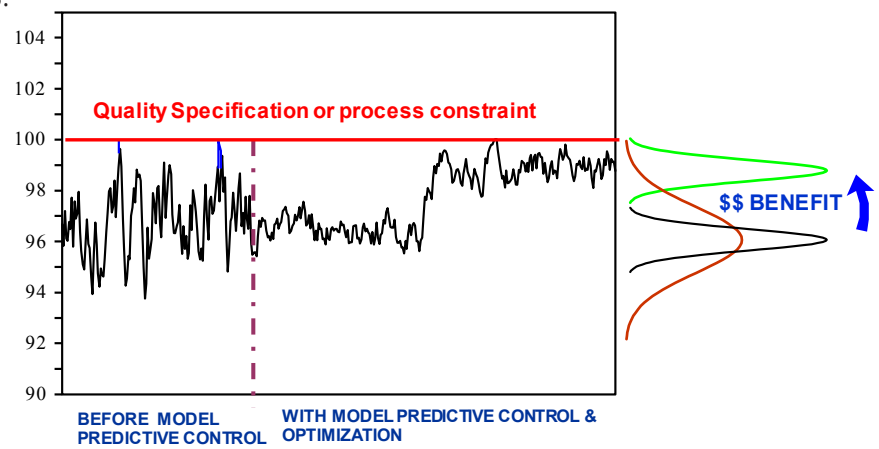
Model Predictive Control is closed loop control technology that uses dynamic control models to predict the future trend of the process. It utilizes actual process conditions and the dynamic models to calculate a series of optimal setpoints in the future that keep the process in control. These calculated setpoint series minimizes the cost of production and maximizes the profit.

A soft sensor is a real-time process model that provides predictive process information of product behaviour needed for uninterrupted quality production.

MPC Models:



MPC Results:



MPC Advantages

- Better than PID: can handle multiple PID controllers and unify their interaction to control the process at minimum costs.
- Better than cascade control: does not wait for process error to respond. Its models anticipate where the process will trend and calculates optimum changes to all PID controllers.
- Better than feed forward control: all models for the process outputs are integrated into one unified controller.
- Provides real-time continuous product quality control
- Handles long dead-times, long time constants, and multiple process interactions

Why MPC in the Process Industry?

- Billions of dollars in energy and material are used to produce process goods. To maximize process efficiency MPC is applied by major process industries. E.g. Refining, Petrochemicals, Pulp and Paper, CPG dryer and evaporators, Alcohol plants including Biofuels and Distilleries.

Applying MPC

- You do not have to shut down the process to implement MPC.
- You do not have to change your DCS or PLCs to implement MPC.
- Operators have the ability to switch MPC on or off if required.

LISTEN. THINK. SOLVE.®

Rockwell Automation Pavilion8® Model Predictive Control

Example

Rockwell Automation has Pavilion8® applications for all process units in a distillery.

MPC Benefits:

- Maximizes conversion from grain to alcohol in the fermenters while maintaining quality consistency in the malt.
- Monitors and optimizes the alcohol stillage separation in the beer still to maximize product yield and maintain malt consistency.

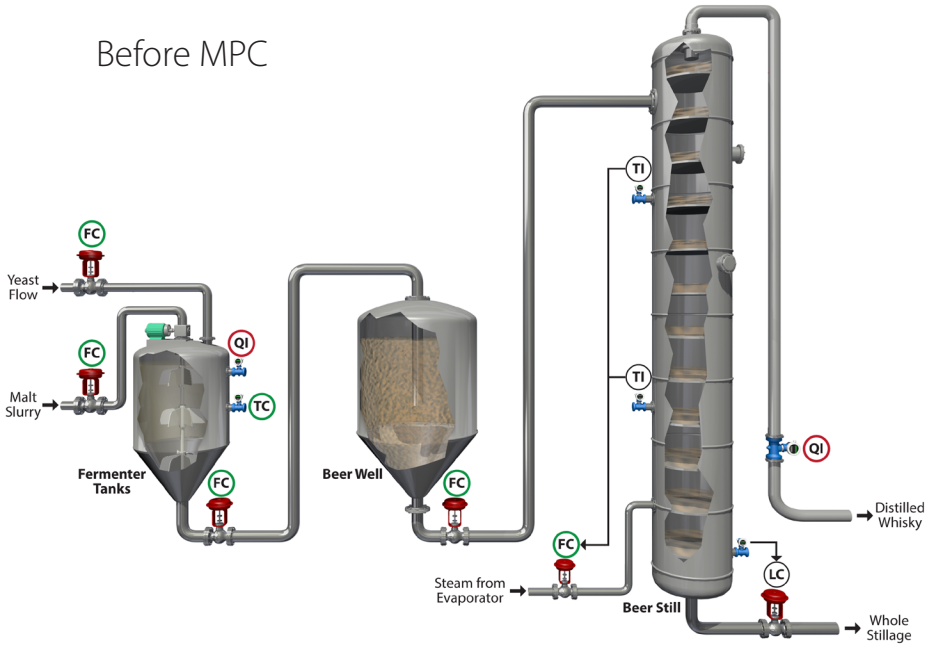
MPC Value:

- Increase Plant Stability - Reduce Process Variance
- Increase Feedstock yield – Reduce waste
- Reduced Energy of Production
- Increased Production (efficient asset utilization)
- Unification of the operating shifts (day/night, weekend)

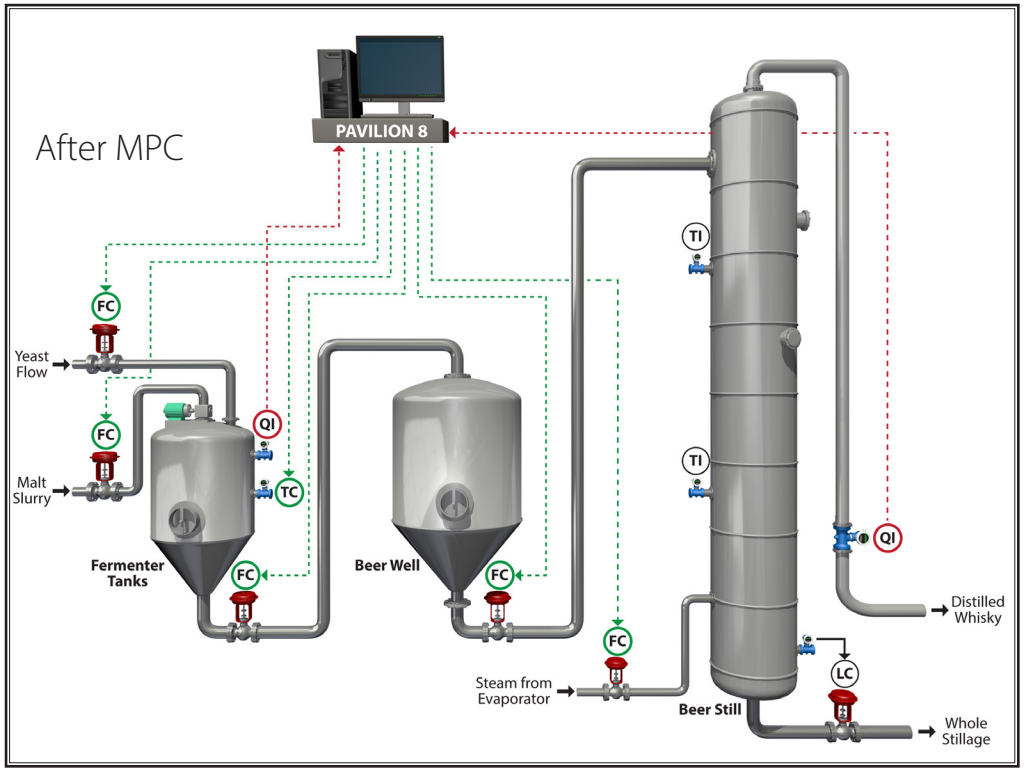
Net effect

MPC provides integrated process control resulting in higher efficiency and improved return on investment.

Before MPC



After MPC



LISTEN. THINK. SOLVE.®

Allen-Bradley • Rockwell Software

Rockwell Automation