Is Process Drift Fueling Inefficiency at Your Plant?

In the highly competitive market for alternative fuels, Glacial Lakes Energy LLC understands that inefficient processes can have a negative effect on plant profitability. Drifting processes hinder quality and reduce throughput. Additionally, the inability to control production within tolerances often demands greater energy consumption. Such inefficiencies put a manufacturer at a distinct disadvantage, especially when the competition includes "Big Oil".

Glacial Lakes successfully applied Control Station's award-winning and patent-pending LOOP-PRO™ software to address process drift and other control related issues. At the cooperative's plant in Watertown, South Dakota, Glacial Lakes put LOOP-PRO™ to the test on processes ranging from Beer Feed and Slurry Flow to Mash Train Cooling and Rectifier Temperature. In each instance, the technology proved the right solution for improving control. That type of efficiency is helping Glacial Lakes to fuel growth and profit.

When a Picture Tells a Thousand Words

Ethanol production involves the hydrolysis of corn starch into sugar and subsequent fermentation of the sugar into alcohol. Distillation and dehydration processes follow, transforming 190-proof alcohol into a 200-proof liquid that serves as a viable alternative to gasoline. A cascaded rectifier column is used to process the low grade alcohol into fuel. Excessive drift in the Rectifier Differential Temperature Cascade loop reduced Glacial Lakes' process efficiency and involved excessive reprocessing of lower grade alcohol.
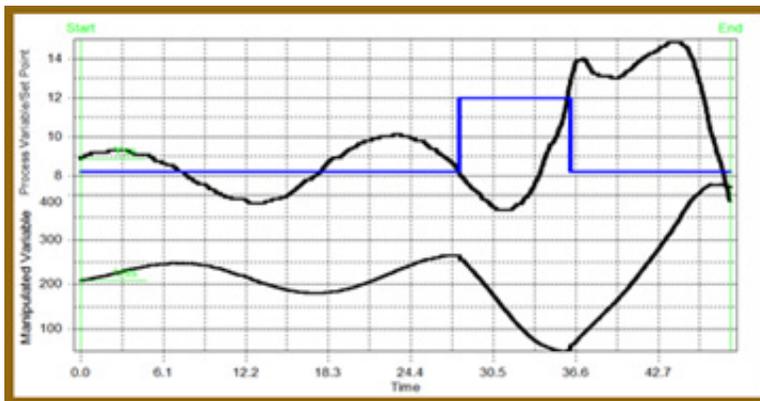

Image 1 is a strip chart from the Watertown Plant's rectifier column. As the image shows, the process was slightly oscillatory before a bump test was performed. The process continued to drift after both the bump up and down, highlighting loose control and explaining ineffective Set Point tracking.
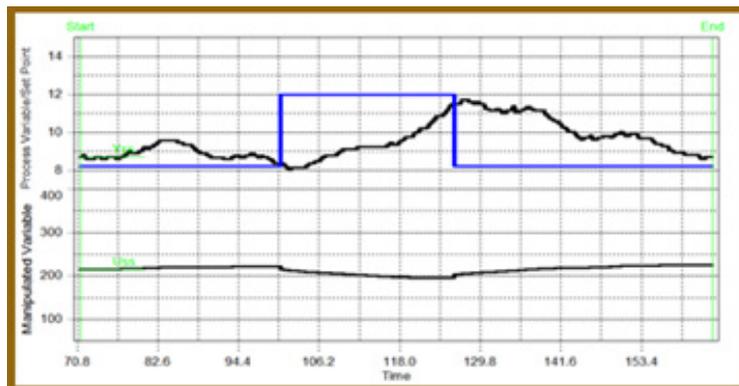

Image 2 showcases a similar disturbance to the rectifier column, but with a dramatically improved result. Using Loop-Pro™, operations staff accurately analyzed the dynamics of this process and determined alternate tuning constants for the PID controller. Oscillations within the rectifier column had been suppressed successfully. Additionally, when the process was later hit with a controlled disturbance, the loop responded to the change with no signs of drift.