What is Process Control? And why you should care – Value Proposition

Sound Process control bring tangible value to the companies. This is fact, not an opinion.

My anecdote at the end of the last note is another example.

I have to be honest though, the need to quantify reliability improvement, improved safety, energy savings, or increased efficiency, was not at the top of my priority list at the start of my career.

This article's purpose is to remind all that process control also requires baselines and key performance indicators (KPIs).

Back in the early 90s, I was working for a Pulp and Paper Company. I designed and implemented my first Advanced Control Application: A Smith Predictor (1). A single-input single-output (SISO) predictive control strategy that uses a process model to predict the future value of the controlled variable based on the current value of the manipulated variable.

Chorine gas (Cl2) was fed to a sodium hypochlorite reactor through a line that had a barometric loop (Figure 1). This was a safety requirement to prevent liquid from backing up into the chlorine storage tank. The gas flow controller loop was the manipulated variable to maintain the required hypochlorite quality, as measured by an Oxidation Reduction Potential sensor. The control loop was permanently in manual

as it had a very long deadtime, transport time, and the operators could not keep it in automatic due to the fact that the controller tuning was too sluggish for a reliable operation of the reactor.

Following the description of the strategy presented in the paper, I implemented the so-called Smith Predictor.

Whether or not Smith Predictor is a good choice is not the point here… we'll leave that for another time, so let's continue.
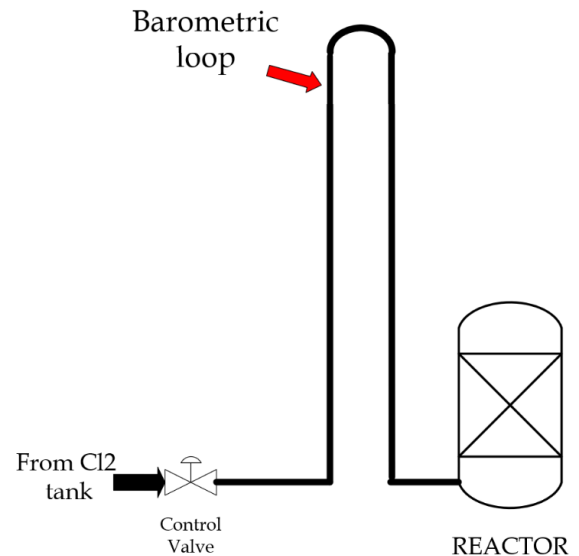

Figure 1

The loop started operating successfully immediately after the commissioning. Very proud of myself, I marched up to the production manager to present my accomplishment. He could not quite follow the meaning of either "Smith Predictor" or "deadtime compensator", and he stopped me in my tracks when he asked: What are the benefits generated by this improved control?

From that point onward, every time a client asks me to help with resolving a process

control related issue, I start by asking a few questions:

- Why is this an issue, or what is the issue?
- What are the benefits you expect will come from resolving it?
- When was the last time you reviewed these controls?
- What would happen if you changed nothing in this process?

And a few more I won't bore you with right now.

Can a value proposition be made for a case like this? Certainly.

the controller's setpoint could be moved closer to the product specifications or to a constraint, allowing the quantification of the economic benefit associated to the increased yield for example.

I think it's prudent to add at this point, that when it comes to calculating or estimating the benefits gained by the implementation of better controls, there is a caveat.

At times, the benefits are economic, or environmental. They can also be social, and translate into benefits in the "optics" or reputational aspects of a company which can help them be in line with policy or present themselves a more attractive investment.

Sometimes, it's a combination or several benefits, including some that we may not have expected and can also surprise us.

The point here is that when working in Process Control it is critical that there is a clear objective so that the solution is

addressing a problem that needs to be resolved.

This is the most effective way of implementing Process control solutions in any industry and can yield range of results, often at a lower investment cost than the purchase of hardware, or software.

References
(1) O. J. Smith, "Closer control of loops with dead time," Chemical Engineering Progress, 53 (1957), pp. 217–219

NEXT: I will be showing how process control relates to Circular Economy.