



Slow Process Response?

Loop Tuning · Smith Predictor · Feed-forward & cascade strategies · Control Strategy Revision



Dealing with Process Lag or Dead Time...

Is your process slow to respond? Are your PID controllers tuned so sluggishly that they are unable to deal with process disturbances? Do you see slow but large swings in your process that force the plant operator to switch to MANUAL? Does your plant operator do a better job than your control system?

PID controllers on processes with large process lag or dead time, are often tuned too sluggishly to deal effectively with process disturbances. Re-tuning these loops for optimal disturbance rejection, may make them unstable under normal operation, resulting in large overshoots and undershoots.

We can deal with process lag or dead time through a variety of control strategies. For example: the Smith Predictor uses a plant model to predict the process response (including disturbances) without the dead time! It can be added to your existing PID strategy and allow you to tune your controller more aggressively resulting in better response to set-point changes and better disturbance rejection!

We have experience with many control systems, but can equally work with your preferred control system integrator, in order to facilitate the implementation of these solutions on your plant control system

The Smith Predictor

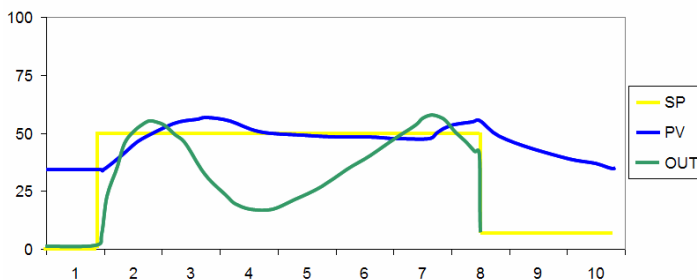
- Originally proposed by O.J.M. Smith in 1957.
- Uses a process model to provide PID controller with process response without time lag but including disturbances.
- Often criticized for poor response to load changes but these can be built into model.
- Tolerates a significant degree of model mismatch owing to feed back through the PID.
- Simply applied to existing PID controllers (replaces existing process variable).

Other Strategies...

- Set-point Ramps / Velocity limiters
- Gain Scheduling & External Logic
- Controller Lead/Lag Filtering.

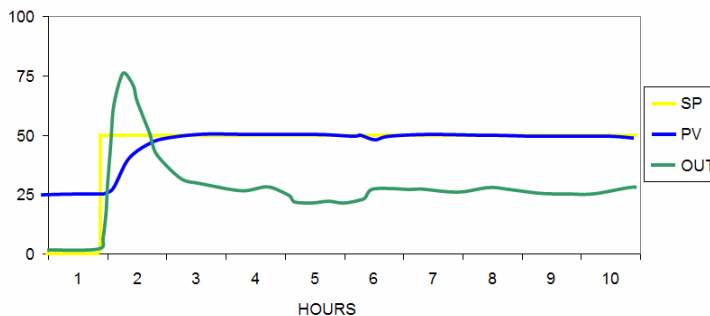
TEMPERATURE CONTROL (PID ONLY)

Process response with PID only

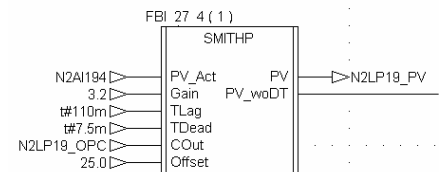


TEMPERATURE CONTROL (PID + SMITH PREDICTOR)

After Insertion of Smith Predictor



Tune your control loops both for minimal overshoot and for disturbance rejection!



Standardized Function Blocks (Programmed on your control system)

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