03/04/2019
1

28 MAY 2019 (TUE)

Visit to SPS IPC Drives (Parma)

Leaving 7.30 AM STARP

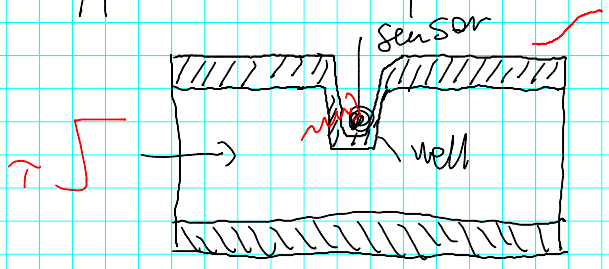
Coming back 6 PM (start from Parma)

For students in (Automation) Engineering

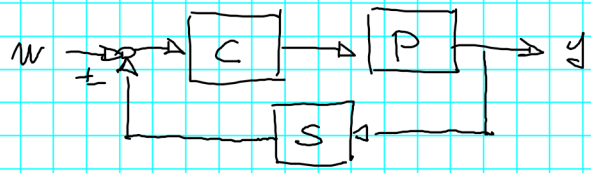
[50] seats

@2 Main dynamics in the feedback path

Typical case: temperature control in pipes



3



Spec. $\frac{y}{w} = T^0$

Ideally $\frac{CP}{1+CPS} = T^0$

$CP = (1+CPS)T^0$

$CP(1-ST^0) = T^0$

$\rightarrow C = \frac{1}{P} \frac{T^0}{1-ST^0}$

4 Example

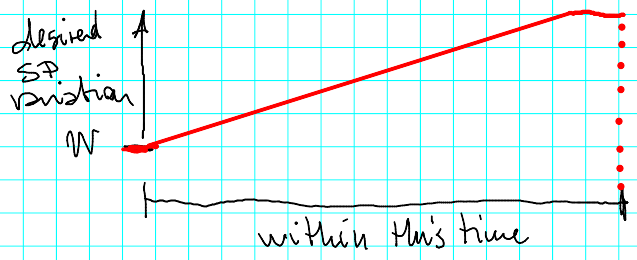
$$P = \frac{1}{1+s} \qquad S = \frac{1}{(1+10s)^2}$$

Take 1: try $T^0 = \frac{1}{1+2s}$

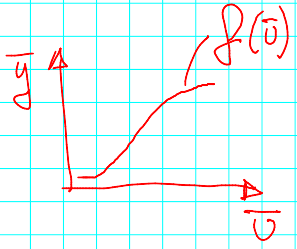
$$C = \underbrace{\frac{1+s}{1}}_{1/P} \frac{\frac{1/1+2s}{}}{1 - \frac{1}{(1+10s)^2}\frac{1}{1+2s}} = \frac{(1+s)/(1+2s)}{\frac{(1+2s)(1+10s)^2 - 1}{(1+2s)(1+10s)^2}}$$

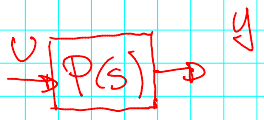
$$= \frac{100s^3 + 120s^2 + 21s + 1}{200s^3 + 140s^2 + 22s}$$

Biasing for large transients



within this time





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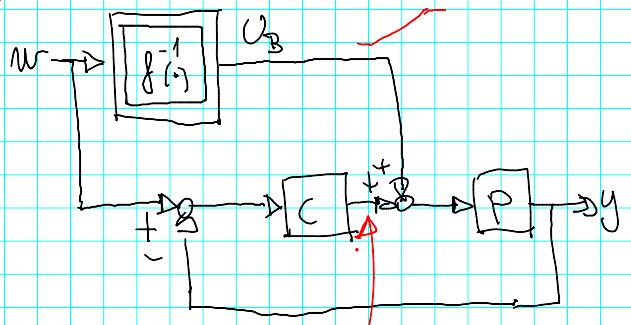

This signals takes care of the non-nominal steady-state behaviour of the process and of dynamics