Feedback Control for Optimal Plant Operation

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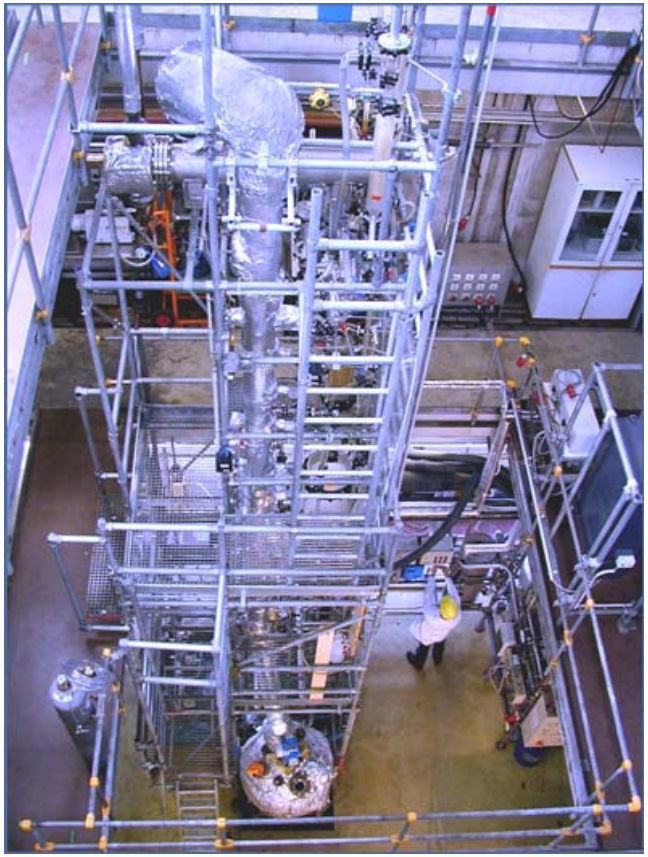
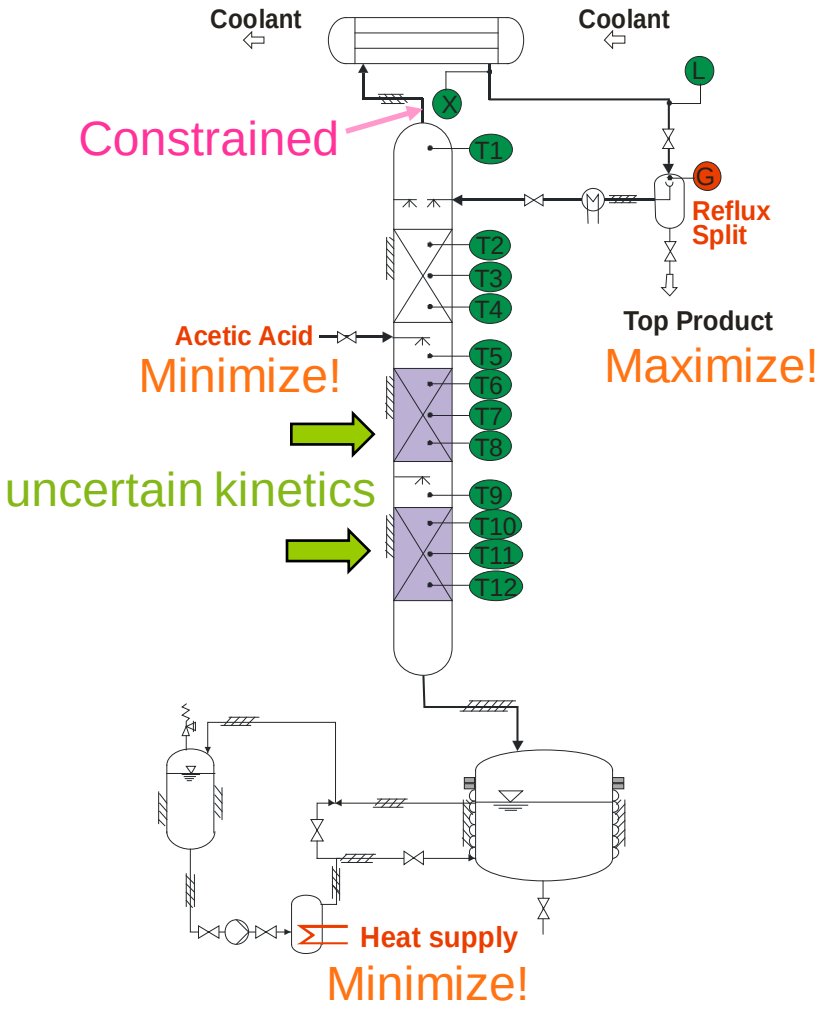
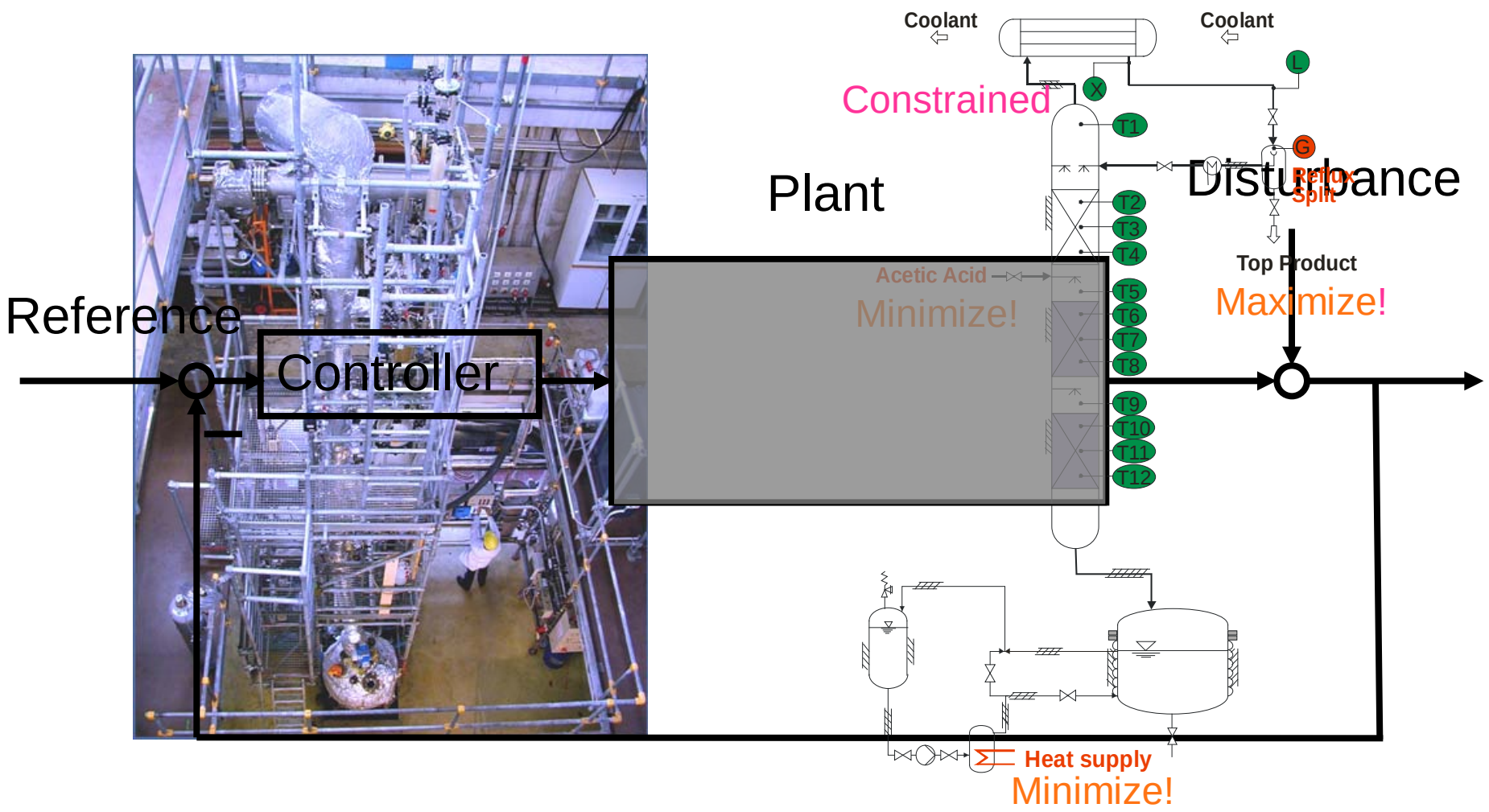
Process Operations



Reactive distillation column



Control Engineering Reduction



Control Engineering

Standard task description:

Choose and design feedback controllers for optimal

- disturbance rejection
- setpoint tracking

for a given “plant“ (i.e. inputs, outputs, dynamics, disturbances, references, model errors, limitations, …)

“SERVO or REGULATION PROBLEM”

- Servo problem formulation is mostly relevant for subordinate tasks:
  - Temperature control
  - Flow control
  - …
- Optimal solution of servo/regulation problems does not imply optimal plant operation – optimal plant operation is not necessarily a servo problem!
- Automatic (feedback) control is often considered as a necessary low level function but not as critical for economic success.

⇒ CONTROL FOR OPTIMAL PLANT OPERATION

Control for Optimal Operation

- How to achieve near-optimal operation?
  - Regulatory control
    → Day 2, Lecture 1
  - Tracking of necessary conditions of optimality
    → Day 2, Lecture 2
  - Online optimizing control (DRTO)
    → Day 2, Lecture 3
- Day 1:
  - Fundamentals of dynamics
  - State estimation