Process control introduction for process engineers training course

Agenda

1. Introduction
    a. Course objectives
    b. The need / motivation for automatic control
    c. The challenges and consequences

2. The main control objectives: Feedback vs. constraint control vs. optimization

3. Development of the control strategy
    a. Selecting the proper input variable (PV)
        i. The importance of the quality (accuracy & timeliness) of the information
        ii. The need for intermediate / auxiliary controls
    b. Selecting the proper input into the process, the manipulated variable (MV)
        i. Fundamental considerations
        ii. One or more MV's
        iii. Split range control
    c. Decision single loop and cascade control

4. Process behaviour
    a. Behaviour types: Self-regulating, integrating, ..
    b. Process dynamics
        i. The key process parameters and their importance for control
        ii. The importance of the controllability ratio

5. Feedback control introduction
    a. Principle, areas of use

6. PID control fundamentals
    a. Principal behaviour
    b. The influence of the process type and dynamics
    c. Limitations of the PID
    d. Alternatives: MBC

7. Handling of disturbances – feedforward disturbance compensation
    a. Principle, decision for use
    b. Prerequisites, importance of the "relative dynamics"

8. Introduction to Model Based Control (MBC), Multivariable Control
    a. Purpose, principle, decision criteria

9. Special considerations:
    a. Recycle streams, heat integration

10. Typical equipment examples: Heat exchanger, vessel, furnace, batch reactor, distillation tower

11. Final remarks, recommendations

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