Practical Process Control for the Practicing Engineer

A 3-day course for Process Design Engineers, Process Control Engineers and Control Systems & Automation staff of all experience levels, that teaches the inter-dependent aspects of process plant design, process control, safety systems design & integration and process automation to achieve reliable and robust plant performance. Utilizing a mixture of lecture and case studies that are gleaned from 30 years of real-world experience with operating plants and design projects, this course addresses the large gap that exists between process design and control theory, as it is normally taught, and its practical application. The course also addresses the growing and diverse knowledge requirements forced upon Control & Instrumentation projects and plant staff resulting from the on-going evolution of automation systems and industry standards.

Process design topics include how to avoid rate-limiting operational constraints in new plant designs by using rudimentary dynamic process analysis for proper equipment sizing early in the design phase, followed by the re-assessment of regulatory control structures after equipment detailed design has been completed. In addition to a variety of controls design challenges, attendees are presented with several industrial case studies that demonstrate the unintended consequences of cost saving equipment design changes and operational considerations for utility systems utilization & control. Control Systems design and retrofit topics include understanding the total cost associated with integrating control and safety systems from different suppliers, project and maintenance staffing requirements for modern control systems and the impact of various de facto industry standards on HMI design and configuration.

*The base course covers **only** the didactic material;* an optional 4 or 5-day course includes time to assess participant's control and/or operational problems that the participants bring from their plant sites or projects. Specific topics covered in the course may vary based on the make-up and specific needs of the class.

In addition to the in-class notes, handouts and copies of the presentations, attendees receive a free lifetime subscription to all current and future S&D Consulting published white papers, as well as periodic updates. The expanding list of white papers forms the foundation of the course and provide technical details and relevant historical background of the lecture subject matter.

Lecture Topics:

- More than *"just instrumentation"*: The Four Bodies of Knowledge that comprise modern Process Control, Instrumentation and Automation
- The evolution of Process Control
- Process Control v. Control Systems: What it is and what it's NOT!
- The 8 Rules for Successful Controls Design and Implementation
- Understanding the PID Controller (without Laplace Transforms)
- The Dark Side of control theory: What the textbooks DON'T tell you!
- Level & Pressure Control: Why it's different & why it matters
- PID Tuning and Trouble-shooting
- APC: love it, hate it... Need it?
- Distillation Control Design Basics
- High Purity Distillation versus traditional Distillation
- Refinery v. Chemical Plant Distillation
- Distillation Heat Recovery and Optimization Design Considerations
- Closed Loop control with GCs
- Complex Loops: Avoiding the pitfalls
- Linearization: the KEY to stability!
- Constraint Control Basics
- Organizing & Documenting your work: Making it part of the Design Process!
- Avoid "rolling your own": Understand the available system capabilities
- Instrument and valve type selection: What to lookout for and avoid!
- Dynamic Analysis in Plant Design
- *"Closing the Loop"* in Process Design
- Dynamic Analysis in Controls Design
- Beware of *cost saving* equipment design changes!
- HMI Format, Structure & Organization: The REAL Value of HMI Standards
- Object Oriented Programming (OOP) for Robust Batch Control Applications
- SIS and 3rd Party Systems Integration: Hardwired v. Soft-link.
- Using a LOPA methodology to justify instrument & controls projects
- C&I Upgrade & Retrofit Requirements: Staffing, Standards and Budgets.
- Legacy DCS Replacement: More than just "wires & I/O"

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3-day Per Attendee Price*:
<6 Attendees:$3250 USD
6+ Attendees:$2785 USD
5-day Per Attendee Price*:
<6 Attendees:$3500 USD
6+ Attendees:$3000 USD

* - Price excludes instructor(s) travel & living costs and any costs for offsite class room facilities, meals & refreshments, etc

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