PID100:
PID Tuning Certification and Primary Process Control

Duration:	**2 Days Classroom or 15 hours Online**
Audience:	**DCS Technicians, Plant Operators, Instrument Engineers, Process Engineers and Process Control Engineers.**
Prerequisites:	**Control room experience as technician, operator or engineer is desirable, but not required.**
Course Material:	**Software Products used in Course - Pitops, Simcet and Training Slides.**

Course Description:

This course addresses needs of control room operators, DCS technicians, process control engineers, applications engineers and anyone else responsible for PID tuning in the plant. Many new personnel enter the control room these days; there are numerous types of processes and different DCS and PLC systems.

This course starts with the basics of process control, explains the PID equation in the time domain and then trains using three powerful PID tuning, real-time simulation/ optimization and grading software products.

In a remarkably short 2-day time, students learn to optimally tune PIDs and make process changes on distillation columns, reactors, tanks, compressors, flow controllers, heat exchangers using modern real-time simulator software.

The software also has automatic grading capability, so at end of the course, the software generates a report card on the PID tuning skills of each attendee.

This course provides good foundation, skills and knowledge for all DCS/PLC related tag building, control scheme design in a DCS/PLC and the ability to calculate tuning parameters not only for PIDs but other control schemes without the old trial-and-error method but scientifically.

Learning Outcomes:

After completing the course, attendees will be able to tune PIDs in any DCS/PLC, troubleshoot problems, dampen/eliminate oscillations, improve controller performance, all of which helps maximize rates, directly increasing the plant's bottom-line profits.

Through practice on a real-time PID tuning simulator, attendees will gain tremendous confidence in PID tuning on live DCS/PLC's in actual operating plants. This confidence that would otherwise have taken several years on the job now can be achieved in just two days. Attendees will also learn many important and practical concepts about DCS/PLC operations. The following topics are covered in this course:

- Introduction to Industrial Process Control Process Control Terminology and Definitions
- Manipulated Variables, Controlled Variables, Disturbance/Feedforward Variables Process Control Dynamics and Process Transfer Functions
- Open Loop Dynamics
- PID Equation in Time Domain and Laplace Domain
- PID Examples in Time Domain with Calculation Illustrations Process Control Schematics

- Positional and Velocity Forms of PID Equation PID Simulations using Pitops and Simcet
- Advanced Forms of PID Algorithms Simulating Noise and Process Disturbances Filter Action and Filter Time Constant
- Estimating Correct Filter Time Constant in DCS or PLC
- Hands-On Lab (Practical) Sessions Using Real-Time PID Simulator Software
- Optimal Tuning Theory and Calculations
- Error Criteria for PID Tuning and Quantifying Control Quality Typical PID Tuning Parameters for Various Types of Processes
- Optimal Tuning using Pitops Simulator with Disturbances, Noise and Setpoint Changes Estimating Process Dynamics from DCS Trends and Operator Knowledge Transforming Process Operating Information into Controller Tuning
- DCS Attributes and Features Controller Modes
- PV Tracking
- Importance of Derivative Action, When to Use/Not to Use Derivative Estimating Derivative Tuning Parameter Scientifically
- Procedures for conducting Step Tests in the Plant
- Continue Hands-On Lab (Practical) Sessions Using Simulator Software Cascade Control Basics
- SP/OP Tracking, Bumpless Transfer
- Timed Tests using Training Simulator for Testing