APC275:
Advanced Process Control Scheme Implementation in DCS or PLC

Duration:	**3 Days Classroom or 21 hours Online**
Audience:	**Process Control Engineers, Advanced Process Control Engineers, Instrument Engineers, DCS/PLC Technicians, Managers and Supervisors.**
Prerequisites:	**2-year or 4-year degree in engineering or operations. A few months of plant/ engineering experience is desirable, but not required. PID100, APC200 are required, DCS450 is nice to complete also.**
Course Material:	**Training Slides.**

Course Description:
This course continues the knowledge and skills building from PID100, APC200 and DCS450. PID100 and APC200 are required courses and it is nice to complete DCS450 before taking this course. This course covers the design of control schemes and implementation inside a DCS or PLC. The course covers how to design and implement various advanced control schemes using real plant examples. The course shows you how to conceptualize the design of APC schemes for maximizing production rates, minimizing utilities, developing schemes to improve the plant's operating efficiencies, protecting equipment from overloading and avoiding shutdowns. The course discusses how to build both standard and custom function blocks inside any DCS or PLC. This includes batch control, continuous control and sequence control. The course takes specific examples of how to build complex and advanced control schemes using a variety of standard and custom blocks in the DCS or PLC that were covered in APC200 and DCS450.

Learning Outcomes:
At the end of this course, students will have the skills to design and build continuous and batch control schemes inside any DCS/PLC. They will have the ability to look at a process flow diagram or P&ID and based on operations goals and objectives, design and implement the appropriate control schemes inside any DCS or PLC. Students will also have the skills to mathematically compute the various tuning parameters and control parameters for the control schemes. The course teaches how to provide automation to stabilize the process operation, how to maximize production, minimize cheaper byproducts, minimize utilities, minimize environmental emissions, increase the profit margins and improve key performance indicators. You can develop many powerful APC schemes in any DCS or PLC with the knowledge from this course and achieve the goals and objectives of plant management. The following topics are covered in this course:

- Using PV transforms for linearizing nonlinear processes
- Ratio control for pure mixing versus complex processes
- Adaptive tuning - as function of PID Output
- Median temperature controller in a reactor
- Average temperature controller in a distillation column
- Distillation reflux mass balance controller
- Signal validation for use in closed loop control
- Analyzer validation logic
- Constraint override control for limiting equipment
- Rate maximizer - with delta temperature and characterizer on valve
- Online heat balance control
- MW power feedforward control scheme
- Cross firing limiting control
- Lab update bias correction
- Online mass balance controller