

## **Practical Process Control Techniques 3 Day Course**

### **DAY ONE**

- Process Control context – objectives, benefits, threats, terminology and structure.
- Process Responses – types and measurement.
- Data analysis – sampling, noise and filtering.
- PID feedback control – PID components, equation types and tuning approaches.
- Tuning techniques – flow, pressure, temperature and level tuning approaches.
  
- Exercises to focus on:
  - Response definition
  - Appropriate use of filtering
  - Use of the Tune Wizard tuning tool

### **DAY TWO**

- Loop performance and instrument vulnerabilities.
- Dealing with Deadtime – tuning and model based control.
- Cascade control – initialisation and anti-windup issues.
- Process non-linearity and how to deal with this.
- Constraint control and ratio control.
- Dynamic compensation and feedforward control.
  
- Exercises to focus on:
  - Diagnosing loop performance problems
  - Issues associated with tuning level loops manually
  - Design of cascaded loops
  - Solutions to Non-linearity
  - PID loop design review
  - Feedforward control design review
- Workshop to discuss specific control issues (attendee supplied)

### **DAY THREE**

- Alternative level control approaches.
- Distillation control approaches.
- Interaction and Decoupling.
- Duty control.
- Use of calculations and pressure compensated temperatures.
- Use of engineering models and developing an inference.
- Analyser feedback control.
- Control scheme design, implementation and maintenance and Operator Needs.
- Multivariable Predictive Control and benefits estimation.
- New Techniques: Neural networks, Fuzzy logic and Expert Systems.
  
- Exercises to focus on:
  - Issues associated with tuning deadtime loops manually
  - Design of duty controllers
  - Level Controller tuning techniques
  - Pressure Controller tuning techniques

Note – although the examples used in the course are based upon use of Tune Wizard from PAS, the purpose of the exercises is to demonstrate generic loop tuning principles and skills applicable to any tuning package.