



IE278: Continuous Process Control Loops

Training Description:

This training course is designed to provide an introduction to process control to engineers and other technical staff. It teaches the base fundamentals, as well as open and closed loop tuning methods. The training course is developed with field tuning in mind, not control design. The training course will discuss the control fundamentals and terminology including the principles, control loop as well as the various types and right selection of control valve and describes the process control methods and characteristics of control valve. It illustrates the different tuning rules available and explains the fundamentals of control systems, proper tuning of PID controllers, the concepts and application of feed forward control, auto tuning and new developments and troubleshooting tuning. The various types of control valves, actuators and valve selection will also be discussed during the course.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply and gain a basic knowledge on continuous process control loops
- ✓ Discuss the control fundamentals and terminology including the principles, control loop as well as the various types and right selection of control valve
- ✓ Describe the process control methods and characteristics of control valve
- ✓ Illustrate the different tuning rules available and explain the fundamentals of control systems
- ✓ Demonstrate the proper tuning of PID controllers and the concepts and application of feed forward control
- ✓ Identify auto tuning and new developments and employ good practices and troubleshooting tuning
- ✓ Discuss the various types of control valves, actuators and valve selection

Training Designed for:

This training course is intended for process controller, control loop & valve tuning for engineers and other technical staff who are willing to learn more about single loop controllers, PID and tuning. The course explains the essence of feedback control without going in-depth into math.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ Pre-Test
- ❖ Control Fundamentals
 - Terminology
 - Principles of Control
 - Basic Control Loop

- Advanced Control Loop
- Control Algorithm
- Control System
- ❖ **Control Valve Types**
 - Butterfly
 - Eccentric
 - Rotary Plug
 - Ball
 - Plug
 - Linear Valves
 - Globe
 - Cage
 - Double Port
- ❖ **How to Select the Right Valve?**
- ❖ **Recap**

DAY TWO:

- ❖ **Process Control Methods**
 - Open Loop
 - Process Behaviour
 - Time Lags
 - Selection of Type of Controller
 - Proportional
 - Integral
 - Derivative
 - Feedback
 - Cascade
 - Ratio
 - Feed Forward
- ❖ **Control Valve Characteristics**
 - Selection of Flow Characteristics
 - Sizing Steps
 - Classification
- ❖ **Control Valve**
 - Cavitation
 - Flashing
 - Noise
- ❖ **Recap**

DAY THREE:

- ❖ **Different Tuning Rules Available**
 - Overshoot
 - Lambda Tuning
 - Trial Tuning
- ❖ **Different Tuning Rules Available**
 - Cohen Coon Tuning

- Process Controlability
- Suggestions & Rules of Thumb
- ❖ **Fundamentals of Control Systems**
 - On-Off Control
 - Cascade
 - Ratio
 - FF
 - FB
 - Prop. Band
 - Integral
 - Derivative
 - Direct/Reverse
- ❖ Recap

DAY FOUR:

- ❖ **Tuning of PID Controllers**
 - Open Loop
 - Ziegler Nichols
 - Continuing Cycling Method
 - Response Lags
 - Closed Loop Control
- ❖ **VIDEO Presentation**
 - Control Tuning
- ❖ **Concepts & Application of Feed Forward Control**
- ❖ Recap

DAY FIVE:

- ❖ Auto Tuning & New Developments
- ❖ Good Practices & Troubleshooting Tuning
- ❖ Types of Control Valves, Actuators & Valve Selection
- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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