

This course enables English-speaking about operation or maintenance staff of industrial installations, in order to become familiar with the principle of single-loop PID (Proportional Integral Derivative) control as well as with basic control architectures, and to learn how to adjust the PID actions of a controller according to the process characteristics. Participants improve their ability to understand the impact of their actions on process control and to diagnose possible control faults.

**Learning objectives :**

- Attendees will acquire the base theory of operation of PID feedback control loops, showing on one hand how a process may react to its command signal, and on the other hand how to adapt controller actions to a particular process.
- They will learn how to set, tune, and troubleshoot various types of control loops.

**Who should attend ?**

Operation and Maintenance Technicians and Engineers, who are new to process control principles, or who wish to be "cross trained".

**Ways and Means :**

- The course provides valuable information via lectures on theoretical concepts, backed-up by direct hands-on training in fully equipped classrooms.
- More than 50 % of the time is dedicated to actually working on various simulated control loops and genuine industrial process control loops.
- A knowledge assessment test followed by its proofreading will be run at the end of the training.

**Prerequisites :**

Knowledge of instrumentation and of basic mathematical concepts such as integral and derivative, as well as basic physical laws, although not required, would be helpful.

**Course content :**

**PID FEEDBACK CONTROL LOOP**

- PID control actions.
- Controller structure.
- Controller operating modes.
- Stable and unstable process response.
- Tuning (trial and error, IRA method, Mr Roche's method).
- Controller complementary functions.

**PARTICULAR CONTROL STRATEGIES**

- Cascade control.
- Feedforward control.
- Override, split-range and ratio control.
- On/off control.

**DCS AND PLC CONTROL CAPABILITIES**

- Function blocks to be found in DCS and PLC'S.
- Examples of control strategy programming.

**CONTROL-LOOP TROUBLESHOOTING**

- How to check if a PID controller works properly.
- Diagnosis of process variable continuous cycling, and of permanent error between process variable and set point.

**HANDS - ON TRAINING (50 %)**

- Wiring, setting and checking digital controllers.
- Tuning P.I.D. control loops on simulated process.
- Tuning and troubleshooting P.I.D. control loops on genuine heat exchangers and other process.

**NOTE**

This training course is part of a two module training package called «PIPC» : Practice of Instrumentation and Process Control, (PPC p. 41 + PRI p. 40).

- Duration**  
37 h over 5 days
- Time schedule**  
monday 9 am. - friday 5 pm.
- Skill level**  
Fundamentals ★★☆☆
- Training objective**  
Acquiring new knowledge
- Skills assessment method**  
Questionnaire with open-ended questions
- Numbers of Attendees**  
Mini : 4 - Maxi : 10
- Instructor in charge**  
Philippe TRICHET
- Main Trainer**  
Philippe TRICHET  
*This training may be run by another instructor*
- Sessions & Tuition**  
*Look at our web site : [www.ira.eu](http://www.ira.eu)*

**In house sessions can be set-up upon request.**

**Additional Information :**

- Senior training instructor, recognised as an expert in his field.
- By the end of the session, a training certificate is delivered with an assessment of acquired skills.
- Meals are included.

**Hands-on Training**

