E- 560

INSTRUMENTATION & PROCESS CONTROL - SAFETY SYSTEM

OBJECTIVES

To provide the participants with a better understanding of the control instrument and the problems related to their use.

At completion of the course, the participants:

- know the main types of instruments and their working principle.
- understand the working principle of the different types of control loops.
- know the typical DCS architecture and the typical Safety System layout.

▲ Who should attend?

Staff involved in the operation or design of the Oil & Gas field processing facilities.

▲ Duration

4 days

▲ Dates & Location

May 27 to 30, 2008
Rueil-Malmaison (Paris)

▲ Tuition Fees

€ **1,590**

▲ Course Coordinator

Franck BEIJER

Ref. **I&R / INSTGB**

COURSE CONTENT

THE CONTROL LOOP — 0.5 day

Function and constitution of control loops and on/off control systems.

Pneumatic, electrical and digital control loops.

Power supply, signal transmission (tubes, cables, bus, optical fibers, ...) and conversion.

Tags and symbols.

SENSORS — 0.75 day

Accuracy and tuning of measuring devices.

Temperature measurement: temperature scales, non-electrical thermometers, electrical measuring devices.

Pressure measurement: measurement units, devices for local reading or for transmission, pressure gauge installation.

Flow measurement: measurement units, head meters, other principles and devices: electromagnetic and ultrasonic meters, vortex effect, Coriolis effect.

Level measurement: level glass, float-actuated and displacer devices.

Other principles and devices: radioactive, capacitance, ultrasonic and radar devices, differential pressure cells.

Safety devices: two-position sensors, position sensors, temperature and pressure sensors.

TRANSMITTERS — 0.25 day

Pneumatic transmitters: transformation of force into a pneumatic signal and amplification, technology and transmitter tuning - Operation of the sensor-transmitter combination.

Electric and electronic transmitters: operating principle of strength equilibrium and displacement transmitters.

Digital and programable transmitters.

CONTROL VALVES — 0.75 day

Linear displacement valves: technology, different plug types, characteristic curves (linear, exponential and quick opening), safety position (AO, AC, FC, FO…).

Positioners: operating principle, types (pneumatic, electro pneumatic, ...).

Other types of control valves: simple and double seat valves, cage valves, “Camflex” type valves, tree-way valves, ...

On/off sensors: position sensors, electro-valves, ...

Safety valves: types, simple and double actuators, ...

CONTROL LOOP IMPLEMENTATION — 0.75 day

Simple, override, and split-range loops.

Fractionation, calculated variable, feedforward control systems.

DISTRIBUTED CONTROL SYSTEM (DCS) - SAFETY SYSTEM LAYOUT — 1 day

Network architecture and constitution - Examples.

Emergency Shut-Down **(ESD)** systems: role, examples of typical architectures.

Fire and gas system: role, typical arrangements.

High Integrity Pressure Protection Systems **(HIPPS)**: role, specificities, typical arrangements.