



**MAESTRO**  
CONSULTANTS

# PUMP & VALVE TECHNOLOGY



## **COURSE OUTLINE 2020**

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## **TRAINING TITLE**

PUMP & VALVE TECHNOLOGY

## **VENUE**

Dubai, UAE

## **DURATION**

5 Days

## **DATES**

13 - 17 December 2020

## **PRICE**

US\$4,000 per attendee including training material/handouts, morning/afternoon coffee breaks and Lunch buffet.

## **TRAINING INTRODUCTION**

The course will cover topics concerning different types of industrial valves, the control valves and the safety relief valves. Hydraulic pumps, the dynamic and the positive displacement types will be addressed in this course. The sealing and flushing systems plus bearing and lubrication loops are also covered.

The selection and troubleshoot of such systems will also be addressed in detail. Delegates will learn how different system operate, their limit of performance and the best operating condition with least troubles and least failure.

## **TRAINING OBJECTIVES**

The participant will gain deeper understanding of the control valves and safety relief valves used in different industrial applications. The delegates will learn more about different types of hydraulic as well as dynamic pumps, their performance, operation, control and trouble shooting. The delegate will be able to select the appropriate type of valves and pumps for the application.

## **TRAINING AUDIENCE**

Heads of Maintenance and Operation, Mechanical and Chemical Engineers, Equipment Specialists, Technical Engineers, Operation Engineers, Planning Engineers, Engineers involved with control and safety valves and pumps of different types.

# **TRAINING OUTLINE**

## **Chapter 1**

### Control Valves

#### Valves Performance

Tightness Criterion

Flow Characteristics

Dead time

Time Constant

#### Valves Design

Linear Type

Rotary Type

#### Valves actuators

Hydraulic actuators

Pneumatic actuators

#### Valves Positioners

## **Chapter 2**

### Safety and Relief Valves

#### Valves Design

Spring-loaded pressure relief valves

Balanced Relief Valves

Pilot Operated PRV

#### Valves characteristics

Design pressure

#### Superimposed back pressure (degree of fluctuation)

Built-up back pressure during operation

Valve Installation

## Valves Sizing and Selection

Calculation of Relieving Area

Constant backpressure

Variable Backpressure

Capacity Requirement for External Fire

Valve Sizing Simplified Method

## Chapter 3

### Valves Troubleshooting

Common-Valve Problems

Cavitation

Flashing

Choked Flow

High Velocities

Water-Hammer

High Noise Level

Fugitive Emission

Installation Faults

Inlet and outlet pipe size

Backpressure effects

Piping supports

Reaction forces

Parallel and series RV installation

## **Chapter 4**

### Hydraulic Pumps

#### Types and Designs

Gear Pumps

Vanes Pumps

Swash piston pumps

#### Performance Curves

#### Operation

Cavitation

Foam and bubbles

Overheating

#### Capacity Control

## **Chapter 5**

### Dynamic Pumps

Centrifugal Pumps

Axial Flow pumps

Performance

Operation

Capacity Control

Multistage Pumps

Balancing Systems

Cavitation Problem

NPSH required

Suction Energy

Sealing Systems

Mechanical seals

Flushing Systems

Bearings and Lubrication

Troubleshooting

## **TRAINING CERTIFICATE**

**MAESTRO CONSULTANTS** Certificate of Completion for delegates who attend and complete the training course

## **METHODOLOGY**

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of “real life” issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.