

**Training Title**

**PUMP & VALVE TECHNOLOGY**

**Training Duration**

**5 days**

**Training Venue & Dates**

REF ME054	Pumps & Valve Technology	5	15 – 19 March, 2020	\$ 4,500	Dubai, UAE
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In any of the 5 star hotels. The exact venue will be intimated on finalizing.

**Training Fees**

- 4,500 US\$ per participant includes Training Materials/Handouts, Tea/Coffee breaks, Refreshments and International Buffet Lunch.

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING DESCRIPTION**

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.

**WHO SHOULD ATTEND**

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 METHODOLOGY**

*DMCT/OL/9/18(Rev3Dt:23/9/18)*

A highly interactive combination of lecture and discussion sessions will be managed to maximize the amount and quality of information, knowledge and experience transfer. The sessions will start by raising the most relevant questions, and motivate everybody finding the right answers. The attendants will also be encouraged to raise more of their own questions and to share developing the right answers using their own analysis and experience

All attendees receive a course manual as a reference.

- 30% Lectures
- 30% Workshops & Work Presentations
- 20% Case Studies & Practical Exercises
- 20% Videos & General Discussions

## **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**

DMCT/OL/9/18(Rev3Dt:23/9/18)

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

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Capacity Control  
Multistage Pumps  
Balancing Systems  
Cavitation Problem  
NPSH required  
Suction Energy  
Sealing Systems  
Mechanical seals  
Flushing Systems  
Bearings and Lubrication  
Troubleshooting

**Note:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**

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