Pumps, Compressors, and Valves: Practical Insights into Operation and Maintenance

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Overview

Pumps, Compressors and Valves are major equipment in all petrochemical, refinery and petroleum firms. Understanding the function, operation, and troubleshooting of this equipment is essential to maintain production and maximise the profitability of the plant. The correct specification and appropriate selection of this equipment increase plant reliability, reduce downtime, and lower operating and maintenance costs. This course will discuss these three significant pieces of equipment and cover different aspects that involve the engineers and technicians.

Course Objectives

At the end of this course, the participants will be able to

- Understand the different types of pumps, valves, compressors and their associated terminology.
- Have an understanding of Centrifugal and positive displacement pumps, packing, mechanical seals and sealing systems, bearings and couplings.
- Understand the various parameters that affect valve operation.
- Select the correct valve for the specific application and perform the necessary calculations to determine the valve size.
- Have the ability to perform troubleshooting of systems involving valves and compressors.
- Determine the appropriate maintenance plan for various types of valves and compressors.

Course Content

1. Pumps

- Pumping Methods
- Types and Range of Operation
- PD Pumps, Reciprocating and Rotary Types
- Dynamic Pumps, Centrifugal and Axial-Flow Pumps
- Pumps Operation, Performance & Control

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Course Content

2. Seals, Bearings, and Installation

- Pump Failures,
- Troubleshooting and Maintenance
- Cavitation in Pumps

3. Compressors

- Compressible vs. Incompressible Fluids
- Gas State Equation, Ideal vs. Actual Gas
- Compression Methods
- Types and Range of Operation
- PD Compressors, Reciprocators and Rotary Compressors
- Centrifugal and Axial Flow Compressors
- Multistage Compressors
- Map of Compressors

4. Failure Modes and Maintenance

- Anti-Surge Systems
- Dry Seal and Journal Bearings
- I Valves
- Valves Technology
- Leak Tight Characteristics
- Flow Characteristics
- Pressure Classification

5. Control Valves

- Check Valves
- Safety Relief Valves
- Valve Sizing and Selection
- Troubleshooting and Maintenance
- Case Studies

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Targeted Audience

Engineers, technicians, and managers responsible for the selection, installation, analysis of machinery failure, troubleshooting, and maintenance of Pumps, Compressors, and Valves need to attend this course.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role-plays
- Indoor & Outdoor games