Introduction To Valves Selection, Maintenance & Repair

Introduction:

Within the boiler, piping and pressure vessel industry, control and safety relief are of most essential importance. Pressure relief valves are the last line of defense against catastrophic failure or even loss of life. The course covers control and safety valve types and designs, materials, specification and selection, preventive maintenance procedures, operation and troubleshooting. The course provides a basic and specialized knowledge of valve types and designs, materials used to make valves, where various designs should and should not be used, factors to consider in specifying a valve for a specific application, how to calculate flow through valves, and valve maintenance and repair. In addition to presenting information on a wide variety of valves, this course also explains the operational basics of the great variety of valves that are found in power stations, refineries, plants, and mills throughout the world.

A number of different instructional methods are used throughout the course to allow interactive learning and to give practical examples from manufacturing and service industry to enable the delegates to operate, select and troubleshoot control and safety valves upon course completion.

Who Should Attend?

Maintenance & Technical Support Engineers & Supervisors, Maintenance & Technical Support Engineers & Supervisors, Senior Foremen Mechanical Maintenance, Engineering, inspection and technical staff in pining designs, process, operations and maintenance, Engineers and working operators in field of pipelines, The course provides a wider knowledge to piping designers, engineers, technicians, foremen inspectors & repair-men.

Course Objectives:

By the end of this course delegates will be able to:

- The ability to carry out the selection and sizing process
- Understand the problems and phenomenon associated with valves operation
- The ability to select the right valve for the particular application
- The ability to perform the necessary calculation for valve sizing
- The ability to carry out troubleshooting of valves and systems that valves are connected to
- The ability to perform troubleshooting of systems involving valves
- The ability to decide on the right maintenance plan concerning different types of valves
- Safety and relief valves play a vital rule for the safety concerning equipment and personnel

Course Outline:

Fundamental Principles

- Hydraulic fluids and their properties
- Hydraulic pumps and intensifiers
- Basics of hydraulic flow in pipes
- Air and gas basics
- Compressors and fans
- Pneumatic components and circuits

- Pressure measurement
- Hydraulic valves and circuits: standard definitions
- Modular valving, electro hydraulic valves
- Servo valves

Valves Selection and Sizing

- Control valve types
- Directional control valves
- Pressure control valves
- Flow control valves
- Safety relief valves
- Valve material, gate valves
- Globe valves, check valves
- Butterfly valves, ball valves
- Plug valves
- Diaphragm valves
- Sizes, classes, and ratings
- Valve selection
- Function and selection
- Process applications
- Valve selection factors
- Valve design
- Control valve trim
- Control valve safety
- Valve sizing for liquid
- Gas and vapor applications

Valve Operation

- Preoperational checks
- Normal operations

- Bypass operations
- Valve inspections
- Abnormal valve conditions
- Automatic valve operation
- Safety valve operation
- Disassembly
- Removing the disc assembly
- Blue checking the seat and disc
- Performing spindle run-out, reassembly
- Installation
- Setting

Relief and Safety Valves and Rupture Discs

- Terminologies and basic definitions
- Relief valves types, operation
- Settings, installations
- Problems, and troubleshooting

Valve Troubleshooting and Maintenance

- Methods for evaluation of mechanical components
- Mechanical components
- Electrical components
- Removing a valve actuator
- Disassembly, and reassembly
- Limit switch adjustment
- Torque switch adjustment
- Operational tests
- Mechanical troubleshooting
- Electrical troubleshooting
- Accepted methods for cleaning

- Adjusting and lubricating various components
- Codes and recommended standards of practice
- Fault finding instruments
- Preventive maintenance

Valves Problems

- High pressure drop
- Cavitation in valves
- Flashing and Cavitation
- Flow choking
- Water hammer
- Steam hammer
- Surge protection
- Check valve slamming
- Noise problems