CONTROL VALVES TECHNOLOGY PORTS, ACTUATORS, SEALING & END CONNECTIONS

TRAINIT ACADEMY

MUE201
Mechanical & Utility Engineering

COURSE TITLE

CONTROL VALVES TECHNOLOGY PORTS, ACTUATORS, SEALING & END CONNECTIONS

COURSE DATE/ VENUE

09 – 13 November 2020

London, UK

COURSE REFERENCE

MUE201

COURSE DURATION

05 days

DISCIPLINE

Mechanical & Utility Engineering

COURSE INTRODUCTION

Control valves, actuators, and pumps are a vital component of modern industrial operations around the world. Today's control valves incorporate a number of impressive design and materials enhancements which allow higher flow capacity and overall compactness with improved dynamic and sealing performance. In addition, recent improvements in actuators and petitioners have made control valve performance and economy an attractive benefit and incentive for their use. Care must be taken, however, to insure that a control valve- actuator system can handle the pressure, temperature, flow rate, and medium required without noise or cavitation, corrosion, erosion or leakage. Pumps are mainly the driving forces in the system; hence their operation, technology, and maintenance are vital parameters for the overall system to run smoothly. Properly selected and maintained control valves and pumps increase efficiency, safety, profitability, and ecology.

The course covers control valve types and designs, materials, specification selection, actuators and controllers, preventive maintenance procedures, operation and troubleshooting. Also, it discusses various types of pumps: operation, technology, and troubleshooting.

A number of different instructional methods are used throughout the course to allow for 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.

COURSE OBJECTIVE

Upon successful completion of this course, the delegates will be able to:

- ✓ Recognize different types of control valves, actuators and pumps and their corresponding advantages.
- ✓ Describe the characteristics of various types of pumps, control valves and actuators.
- ✓ Explain the basic operation of control valves and the underlying fluid mechanics principles.
- ✓ Appreciate common problems encountered in control valves and Pumps including cavitation, water hammering, flashing, noise, vibration erosion and corrosion.
- ✓ Obtain hands-on training on valve and pump sizing based on head loss and flow rate calculations.
- ✓ Choose the right control and pumps, how to read the performance curves of pumps, and understand the limits on the pumps operation
- ✓ Recognize the different types of materials used for the valve body, trim, packing boxes and gaskets and understand the design considerations for selecting these materials.

COURSE AUDIENCE

The course is designed for plant safety specialists, maintenance engineers and technicians, maintenance planners, system engineers and operators in the power

generation, oil, chemical, paper and other processing industries involved in control valve selection, specification, procurement, inspection, troubleshooting or repair.

COURSE CONTENT

Introduction to control valves: Valve functions and service conditions, body ratings, materials and body styles, linear and rotary action valves, globe valves, gate valves, plug valves, ball valves, butterfly valves, cavitation, water hammer, noise, vibration.

Control valve dynamics: Control of automatic valves, control functions and relevant terminology, safety, stability & accuracy, on/off and continuous control modes. Proportional, integral and derivative control actions, control loops and feedback systems.

Sizing of control valves: Control valve flow characteristics, fast opening characteristics, linear characteristics, equal percentage characteristics, matching characteristics, capacity and flow coefficients, control valve sizing for water systems, control valve sizing for steam systems, control valve sizing for oil and gas systems.

Actuators and positioners: Pneumatic actuators, operation and options of pneumatic actuators, piston actuators, diaphragm actuators, direct acting and reverse acting actuators, positioners, electric actuators, valve motor drives, modulating, hydraulic actuators, forces on actuator, sizing and selection of valve actuator.

Pumps: Pumping methods; Centrifugal pumps, Reciprocating pumps, and Rotary pumps. Pump operation, control and performance curves. Pump Technology and design.

Auxiliary Pump Systems: Bearings, seals, oil lobes etc.

Quality standards and maintenance: Standards organizations, ISA, ASME, NACE and ISO, installation, commissioning, routine maintenance, troubleshooting diagrams, modes of failure and fault finding.

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

$6,150 per Delegate. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions