



MU295: Valve Maintenance - Maintain & Inspect Atmospheric Tanks

Training Description:

The aim of this training course is to provide a basic and advanced understanding of how control valves function, maintenance and troubleshooting, also how positioners operate and how flow conditions can affect internal components. The training course also looks at various trim types and why the correct choice in these is important. Explanations are given on pressure recovery, cavitation and flashing within the valve. Each participant will appreciate the potential health, safety and environmental hazards associated with Control valves and their associated processes, looking at the consequences of control valve malfunction.

Furthermore, this intensive course will also cover the maintenance and inspection of atmospheric tanks. The training course will cover the inspection practices for atmospheric & low-pressure storage tanks and will give an insight of API RP 575.

Training Objectives:

By the end of the training, participants will be able to :

- ✓ Identify different Control valve components and their basic design functions
- ✓ Operate different Control valve types and identify potential setting problems
- ✓ Recognise when Control valve maintenance is required
- ✓ Carry out basic Control valve maintenance and Function
- ✓ Test Control valves following maintenance procedures
- ✓ Gain an in-depth knowledge in maintenance and inspection of atmospheric tanks

Training Designed for:

This course is intended for Engineers, Operators and Mechanical Technicians, Practicing Engineers and Technicians who are seeking advanced training in sizing and problem solving, Operations & Maintenance personnel, Inspectors, QC personnel, coordinators and planners. This course requires a basic experience or 'user' qualification.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ PRE-TEST and skill gap analysis
- ❖ Definition of control valve function in process systems
- ❖ How control valves are used in process industries
- ❖ How control valves can affect process efficiency, product quality, maintenance, safety, and the environment (illustrated by video)
- ❖ Systems analysis approach to selecting a control valve
- ❖ Types of data needed to choose a control Valve for a system (illustrated by video)

- ❖ Identify examples and applications of linear and rotary valves as well as the associated function and components of valve trim
- ❖ Differential pressure and flow path affect fluid flow
- ❖ Corrosion and erosion affects trim design (illustrated by video)
- ❖ Corrosion and erosion
- ❖ Advantages and disadvantages of various packing materials
- ❖ Seal designs that are required where leakage is not acceptable

DAY TWO:

- ❖ Principles of pneumatic valve actuation
- ❖ Diaphragm actuator parts (illustrated by video and animations)
- ❖ Actuator response (illustrated by video and animations)
- ❖ Operation of piston actuators
- ❖ Advantages and limitations of pneumatic actuators
- ❖ Electric actuator operation (illustrated by video and animations)
- ❖ Common actuator and positioner types
- ❖ Positioner function (illustrated by video and animations)
- ❖ Principles of pneumatic positioner operation
- ❖ Positioner parts (illustrated by video and animations)
- ❖ How positioners can improve valve response time
- ❖ How positioners can change valve flow characteristics
- ❖ How positioners can change actuator response
- ❖ Selection factors that indicate the appropriate actuator or positioner for system applications

DAY THREE:

- ❖ Control valve malfunctions
- ❖ Causes and effects of control valve malfunctions
- ❖ The importance of following facility safety guidelines and manufacturer's recommendations for valve maintenance
- ❖ Linear valve disassembly steps
- ❖ Clean and inspect linear valve packing and trim
- ❖ Recommend replacement of linear valve trim parts
- ❖ Linear valve parts replacement (illustrated by video)
- ❖ Linear valve packing replacement
- ❖ List linear valve re-assembly steps
- ❖ Outcome of linear valve stroking
- ❖ Linear valve leak testing (illustrated by video)
- ❖ Necessity of linear valve lapping
- ❖ Lapping process (illustrated by video)
- ❖ Rotary valve disassembly steps (illustrated by video)
- ❖ Clean and inspect rotary valve packing and trim
- ❖ Replacement of rotary valve trim parts
- ❖ Replacement of other rotary valve parts
- ❖ Replacement of rotary valve packing replacement
- ❖ Rotary valve re-assembly (illustrated by video)

- ❖ Outcome of rotary valve stroking

DAY FOUR:

- ❖ Common symptoms of a failed diaphragm actuator
- ❖ Causes of a diaphragm actuator failure
- ❖ Maintenance requirements for a diaphragm actuator
- ❖ Remove and inspect the stem and diaphragm assembly and the range spring and seal bushing on a diaphragm actuator
- ❖ Replace the gasket and O-ring on a diaphragm actuator (illustrated by video)
- ❖ List common symptoms of a failed piston actuator
- ❖ List the causes of piston actuator failure
- ❖ List maintenance requirements for a piston actuator
- ❖ Removing and inspection the ring and the stem and piston assembly on a piston actuator (illustrated by video)
- ❖ Common failures of pneumatic and electro-pneumatic positioners and the causes of failure (illustrated by video)
- ❖ Maintenance requirements for a pneumatic positioner
- ❖ Inspect and clean the pilot relay assembly on a pneumatic positioner (illustrated by video)
- ❖ Causes of i/p transducer failure on an electro-pneumatic positioner
- ❖ Adjust the zero and span on an electro-pneumatic positioner
- ❖ Control valve troubleshooting
- ❖ Prevention, rather than cure
- ❖ Types of problems (illustrated by video and animations)
- ❖ Methods for diagnosing problems and causes
- ❖ Use of diagnostic tools to aid

DAY FIVE:

- ❖ Maintain and inspect Atmospheric tanks
- ❖ Inspection and practices for Atmospheric & Low-Pressure Storage Tanks
 - Scope
 - Terms & definitions
 - Type of storage tanks
 - Types, frequency and methods of inspections
 - Leak testing & Hydro testing
- ❖ API RP 575 Overview
- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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