

COURSE OVERVIEW ME0122
Valves & Steam Traps

Course Title

Valves & Steam Traps

Course Date/Venue

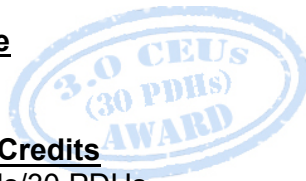
Session 1: July 07-11, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: December 14-18, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference

ME0122



Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Valves, Relief Valves, Strainers and Steam Traps. Participants will gain a thorough understanding of the principles, applications, maintenance, and troubleshooting of these critical components in fluid and steam systems.



The course will cover the functions and difference among various types of valves covering gate valve, globe valve, plug valve, ball valve, check valve, needle valve, diaphragm valve and butterfly valve; the valve symbols and actuators; and the valve glossary and piping overview.



During this interactive course, participants will learn the safety relief valve types, functions and design features; the types of strainers comprising of temporary strainer, y-type strainer, mono-in-line strainer and duplex-strainer; the types of steam traps covering mechanical steam traps, thermostatic and fixed-orifice traps; the valve maintenance, preventive maintenance, start-up and overhauling; the valve leakage and proper installation, sizing and selection of valve; and the maximum allowable pressure drop.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on valves, safety relief valves, strainers and steam traps
- Discuss valves and its principal functions
- Distinguish the difference among various types of valves including gate valve, globe valve, plug valve, ball valve, check valve, needle valve, diaphragm valve and butterfly valve
- Illustrate valve symbols and actuators
- Review valve glossary and piping overview as well as safety relief valves, definitions, types, functions and design features
- Discuss numerous types of strainers including temporary strainer, y-type strainer, mono-in-line strainer and duplex-strainer as well as the types of steam traps including mechanical steam traps, thermostatic and fixed-orifice traps
- Employ valve maintenance, preventive maintenance, start-up and overhauling
- Identify valve leakage in all types and carryout proper installation, sizing and selection of valve
- Analyze maximum allowable pressure drop

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Harward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.

Who Should Attend

This course provides an overview of all significant aspects and considerations of valves, safety relieve valves, strainers and stream straps for maintenance engineers, application engineers, inspection engineers, mechanical engineers, under-development engineers, electrical/electronics engineers, control systems and instrumentation engineers, production engineers, wellhead & drilling engineers and the new valve designers. Further, this course is essential for supervisors, foremen and other technical staff.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Certificate(s)

- (1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-



- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

* Haward Technology * CEUs * Haward Technology * CEUs * Haward Technology * CEUs * Haward Technology *

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Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

CEUs

TOR Issuance Date: 20-Sep-18

HTME No. PAR10047

Participant Name: Salem Al Nabhani

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
ME0122	Valves, Safety Relief Valves, Strainers & Steam Traps	September 16-20, 2018	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY



Maricel De Guzman
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by











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Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- 
The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Andrew Ladwig is a **Senior Process & Mechanical Engineer** with over **25 years** of extensive experience within the **Oil & Gas, Refinery, Petrochemical & Power** industries. His expertise widely covers in the areas of **Ammonia Manufacturing & Process Troubleshooting, Distillation Towers, Crude Oil Distillation, Fundamentals of Distillation** for Engineers, **Distillation** Operation and Troubleshooting, **Advanced Distillation Troubleshooting, Distillation Technology, Vacuum Distillation, Ammonia Storage & Loading Systems, Ammonia Plant Operation, Troubleshooting & Optimization, Ammonia Recovery, Ammonia Plant Safety, Hazard of Ammonia Handling, Storage & Shipping, Operational Excellence in Ammonia Plants, Fertilizer Storage Management (Ammonia & Urea), Fertilizer**

Manufacturing Process Technology, Sulphur Recovery, Phenol Recovery & Extraction, Wax Sweating & Blending, Petrochemical & Fertilizer Plants, Nitrogen Fertilizer Production, Petroleum Industry Process Engineering, Refining Process & Petroleum Products, Refinery Planning & Economics, Safe Refinery Operations, Hydrotreating & Hydro-processing, Separators in Oil & Gas Industry, Gas Testing & Energy Isolations, Gas Liquor Separation, Industrial Liquid Mixing, Wax Bleachers, Extractors, Fractionation, Operation & Control of Distillation, Process of Crude ATM & Vacuum Distillation Unit, Water Purification, Water Transport & Distribution, Steam & Electricity, Flame Arrestors, Coal Processing, Environmental Emission Control, R&D of Wax Blending, Wax Molding/Slabbing, Industrial Drying, Principles, Selection & Design, Process Safety Design, Certified Process Plant Operations, Control & Troubleshooting, Operator Responsibilities, Storage Tanks Operations & Measurements, Tank Design, Construction, Inspection & Maintenance, Atmospheric Tanks, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Performance, Efficiency & Optimization, Continuous Improvement & Benchmarking, Process Troubleshooting Techniques, Oil & Gas Operation/Introduction to Surface Facilities, Pressure Vessel Operation, Plant & Equipment Integrity, Process Equipment Performance & Troubleshooting, Plant Startup & Shutdown, Startup & Shutdown of the Plant While Handling Abnormal Conditions, Flare & Relief System, Process Gas Plant Start-up, Commissioning & Problem Solving, Process Liquid and Process Handling & Measuring Equipment. Further, he is also well-versed in Compressors & Turbines Operation, Maintenance & Troubleshooting, Heat Exchanger Overhaul & Testing Techniques, Balancing of Rotating Machinery (BRM), Pipe Stress Analysis, Valves & Actuators Technology, Inspect & Maintain Safeguarding Vent & Relief System, Certified Inspectors for Vehicle & Equipment, Optimizing Equipment Maintenance & Replacement Decisions, Certified Maintenance Planner (CMP), Certified Planning and Scheduling Professional (AACE-PSP), Material Cataloguing, Specifications, Handling & Storage, Steam Trap Design, Operation, Maintenance & Troubleshooting, Steam Trapping & Control, Column, Pump Technology, Pump Selection & Installation, Centrifugal Pumps Troubleshooting, Pumps Design, Selection & Operation, Pump & Exchangers, Troubleshooting & Design, Rotating Equipment Operation & Troubleshooting, Control & ESD System, Detailed Engineering Drawings, Codes & Standards, Budget Preparation, Allocation & Cost Control, Root Cause Analysis (RCA), Production Optimization, Permit to Work (PTW), Project Engineering, Data Analysis, Process Hazard Analysis (PHA), HAZOP Study, Sampling & Analysis, Training Analysis, Job Analysis Techniques, Storage & Handling of Toxic Chemicals & Hazardous Materials, Hazardous Material Classification & Storage/Disposal, Dangerous Goods, Environmental Management System (EMS), Supply Chain, Purchasing, Procurement, Logistics Management & Transport & Warehousing & Inventory, Risk Monitoring Authorized Gas Tester (AGT), Confined Space Entry (CSE), Personal Protective Equipment (PPE), Fire & Gas, First Aid and Occupational Health & Safety.

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer, Project Engineer, Reliability & Maintenance Engineer, Maintenance Support Engineer, Process Engineer, HSE Supervisor, Warehouse Manager, Quality Manager, Business Analyst, Senior Process Controller, Process Controller, Safety Officer, Mechanical Technician, Senior Lecturer and Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's degree in Chemical Engineering** and a **Diploma in Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Valves
0930 – 0945	Break
0945 – 1100	Principal Functions of Valves
1100 – 1230	Gate Valve
1230 – 1245	Break
1245 – 1420	Globe Valve
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0930	Plug Valve
0930 – 0945	Break
0945 – 1100	Ball Valve
1100 – 1230	Check Valve
1230 – 1245	Break
1245 – 1420	Needle Valve
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0930	Diaphragm Valve
0930 – 0945	Break
0945 – 1100	Butterfly Valve
1100 – 1230	Valve Symbols
1230 – 1245	Break
1245 – 1420	Valve Actuators
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	Valve Glossary & Piping Overview
0830 – 0930	Safety Relief Valves Definitions • Types • Functions • Design Features
0930 – 0945	Break
0945 – 1100	Types of Strainers Temporary Strainer • Y-Type Strainer • Mono-in-Line Strainer • Duplex Strainer
1100 – 1230	Types of Steam Traps Mechanical Steam Traps • Thermostatic • Fixed-Orifice

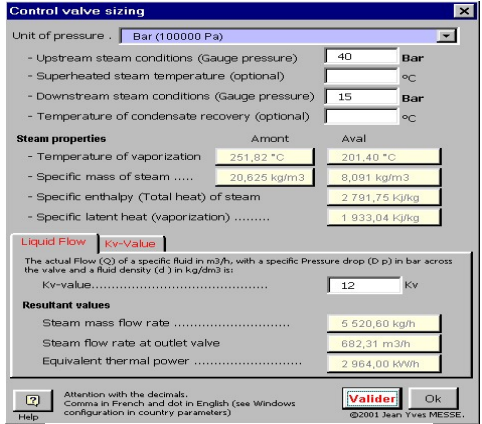
1230 - 1245	<i>Break</i>
1245 - 1420	Valve Maintenance <i>Preventive Maintenance • Prior to Start-up • After Start-up • Workshop Overhaul & Maintenance Tips</i>
1420 - 1430	Recap
1430	<i>Lunch & End of Day Four</i>

Day 5

0730 - 0930	Valve Leakage
0930 - 0945	<i>Break</i>
0945 - 1100	Valve Installation
1100 - 1230	Valve Sizing & Selection
1230 - 1245	<i>Break</i>
1245 - 1300	Maximum Allowable Pressure Drop
1300 - 1400	COMPETENCY EXAM
1400 - 1415	Course Conclusion
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the “Valve Sizing Software, Valve Software 3.0, Valvestar 7.2 Software, PRV2SIZE Software” simulator.



Control valve sizing

Unit of pressure : Bar (100000 Pa)

- Upstream steam conditions (Gauge pressure) : 40 Bar

- Superheated steam temperature (optional) : °C

- Downstream steam conditions (Gauge pressure) : 15 Bar

- Temperature of condensate recovery (optional) : °C

Steam properties

Amont	Aval
- Temperature of vaporization : 251,82 °C	201,40 °C
- Specific mass of steam : 20,625 kg/m ³	8,091 kg/m ³
- Specific enthalpy (Total heat) of steam : 2 791,75 KJ/kg	
- Specific latent heat (vaporization) : 1 933,04 KJ/kg	

Liquid Flow [Kv-Value]

The actual Flow (Q) of a specific fluid in m³/h with a specific Pressure drop (D p) in bar across the valve and a fluid density (d) in kg/dm³ is:

Kv-value..... : 12 Kv

Resultant values

Steam mass flow rate : 5 520,60 kg/h

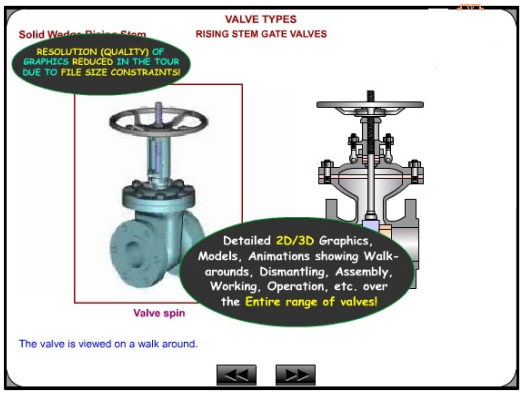
Steam flow rate at outlet valve : 682,31 m³/h

Equivalent thermal power : 2 964,00 kW/h

Attention with the decimals:
Comma in French and dot in English (see Windows configuration in country parameters)

Validater Ok

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VALVE TYPES
RISING STEM GATE VALVES

Solid Welded-Blow-Down

RESOLUTION (QUALITY) OF GRAPHICS REDUCED IN THE TOUR DUE TO FILE SIZE CONSTRAINTS!

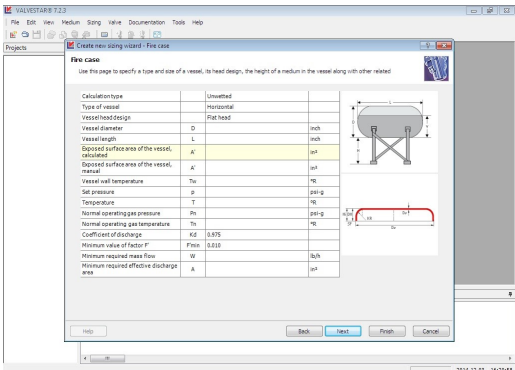
Detailed 2D/3D Graphics, Models, Animations showing Walk-arounds, Dismantling, Assembly, Working, Operation, etc. over the Entire range of valves!

Valve spin

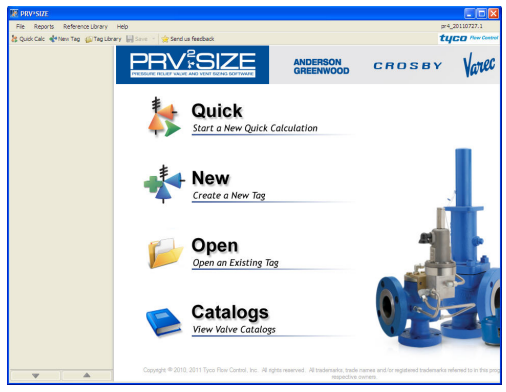
The valve is viewed on a walk around.

Valve Sizing Software

Valve Software 3.0



Valvestar 7.2 Software



PRV²SIZE Software

Course Coordinator

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