



COURSE OVERVIEW PE0221

Operation of Process Equipment

Fired Heaters, Air Coolers, Heat Exchangers, Pumps, Compressors, Crude Desalter, Pressure Vessels & Valves

Course Title

Operation of Process Equipment: *Fired Heaters, Air Coolers, Heat Exchangers, Pumps, Compressors, Crude Desalter, Pressure Vessels & Valves*

Course Date/Venue

December 08-12, 2024/Meeting Plus 6, City Centre Rotana Doha, Doha, Qatar

Course Reference

PE0221



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.

The course is designed to provide delegates with a detailed and up-to-date overview on the operation of the hydrocarbon process equipment that includes fired heaters, air coolers, heat exchangers, pumps, compressors, crude desalter, pressure vessels and valves.



It covers the characteristics of crude oil and function of chemicals used in the process such as composition of petroleum, hydrocarbon properties, salt concentration and emulsions.

At the completion of the course, participants will be able to apply oil treating; dehydration and desalting; process and equipment operations; and employ the sequence of desalter plant start-up.



The course will also cover the different types and function of direct fired heaters; safety aspects; air coolers; heat exchangers; pumps; compressors; process vessels; valves; and troubleshooting of different equipment and processes.



Course Objectives

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

- Apply proper techniques and procedures on the operation of the hydrocarbon process equipment such as fired heaters, air coolers, heat exchangers, pumps, compressors, crude desalter, pressure vessels and valves
- Enumerate the characteristics of crude oil and identify the function of chemicals used in the process such as composition of petroleum, hydrocarbon properties, salt concentration and emulsions
- Discuss oil treating, dehydration and desalting including the process and equipment operations
- Employ the sequence of desalter plant start-up and identify the different types and function of direct fired heaters including the safety aspects
- Differentiate the various types of air coolers, heat exchangers, pumps and compressors
- Describe the types and functions of process vessels and valves including the troubleshooting of different equipments and processes

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward 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 operational aspects of the hydrocarbon process equipment for engineers and other technical staff who are involved in the operation and troubleshooting of various process equipment including fired heaters, air coolers, heat exchangers, pumps, compressors, crude desalter, pressure vessels and valves. The course is also beneficial for design engineers and maintenance 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)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

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.

-  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.

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. Jamal Khaled is a **Senior Process & Petroleum Engineer** with over **25 years** of practical experience within the **Oil & Gas**, industry. His experience covers **Operation of Upstream & Midstream Process Facilities, Operation of Process Equipment** (Fired Heaters, Heat Exchangers, Air Coolers, Piping, Pumps, Compressors and Process Control & Troubleshooting), **Heat Exchanger Design, Operation & Maintenance, Surface Production Operations, Advanced Oil Wells, Separation & Oil Treatment, Treatment of Oily Produced Water, Gas Dehydration & Sweetening, Compressors & Utilities System, Flare & Disposal Systems Operation & Troubleshooting, Heat Exchangers, Fired Heaters, Process Plant Startup, Commissioning & Troubleshooting, Oil Movement Storage & Troubleshooting, Gas Compression & Foundation, Gas Compression Train Operations & Maintenance, Gas Dehydration (TEG) Principles, Operations & Maintenance, Gas Dehydration (Mole Sieve) Operations & Maintenance, Acid Gas Removal (AGRU) Operations & Maintenance, Gas Fractionation & Separation Operations Principles & Practices, Gas Processing Chemical Treatment Principles, Advanced Distillation Operation, Control, Design & Troubleshooting, Troubleshooting Process Operation & Problem Solving, Process Plant Troubleshooting & Engineering Problem Solving, Process Equipment Operation, Process Plant Operation, Process Plant Optimization, Oil & Gas Field Operation, Oil Movement, Storage & Troubleshooting, Petroleum Refinery Process, Process Reactor Operation & Troubleshooting, LNG & LPG Plants Gas Processing, Refinery Process Operations Technology, Distillation Column Design & Operation, Gasoline & Diesel Fuel Technology, Gas Sweetening & Sulfur Recovery, Gas Dehydration Units, Gas Sweetening Units, Fractionation Towers, Gas Compressors, Sulphur Recovery (SRU) & Utilities, Steam & Heat Recovery Systems, Flare & Pressure Relief Systems, NGL Recovery & Fractionation and Refrigerant & NGL Extraction. Further, he is also well-versed in Oil & Gas Producing Wells, Well Head Design & Selection H₂S, Sour Gas Compatible Material X-Mas Tree, Electrical Submersible Pumping (ESP) Operations, Design & Troubleshooting, Sucker Rod Pumping System Application, Operation, Troubleshooting & Maintenance, Well Integrity Management System, X-Mass Tree & Wellhead Operation & Testing, Artificial Lift Systems, Selection & Operation, Artificial Lift Surface Equipment, Advanced Stuck Pipe Prevention & Fishing Operation, Well Completion Design & Operations, Casing, Cementing & Fluid, Pipeline & Pigging Operations, HP/IP/LP Separation, Industrial Water Treatment System & Operations, H₂S, Confined Space Entry, Permit To Work (PTW) and Authorized Gas Tester. He is currently the **On Job Instructor/Trainer** of Majnoon Oil Field.**

During his career life, Mr. Jamal has gained his practical and field experience through his various significant positions and dedication as the **Oil & Gas Operation Instructor, OJT Operation Trainer, Operation & HSE Instructor, Operation & Competency Assessor/Internal Verifier, Operation Engineer, Operation Supervisor, Operation Section Head, Production Supervisor, Senior Operator and Senior Instructor/Trainer** from various international companies such as the AIFurat Petroleum Company (AFPC), ADCO, Basrah Gas Company-Iraq, North Rumaila NGL Plant, Anton Oilfield Services and Majnoon Oil Field-Iraq, just to name a few.

Mr. Jamal has a **Bachelor's** degree in **Petroleum Engineering**. Further, he is a **Certified Training of Trainer (ToT)**, an **Authorized H₂S Trainer**, a **Certified OPITO Competency Assessor**, an **Authorized Assessor/Verifier in Oil & Gas Operation**, a **Certified Instructor/Trainer** and has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.



Course Fee

US\$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

In addition to the Course Manual, participants will receive an e-book “*Operator’s Guide to Rotating Equipment: An Introduction to Rotating Equipment Construction, Operating Principles, Troubleshooting and Best Practices*”, published by AuthorHouse.

Course Program

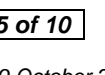
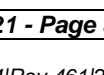
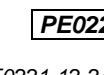
The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 08th of December 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Characteristics of Crude Oil Composition of Petroleum • Hydrocarbon Gases Properties
0930 – 0945	Break
0945 – 1100	Characteristics of Crude Oil (cont’d) Salts Concentration • Emulsions • Function of Chemicals Used in the Process
1100 – 1230	Oil Treating, Dehydration & Desalting Emulsion Formation & Breaking • Vertical & Horizontal Theater Operation • Electrostatic Theatre Design/Operation • The Desalting Process/Equipment • Emulsion Treating
1230 – 1245	Break
1245 – 1420	Oil Treating, Dehydration & Desalting (cont’d) Separators – Free Water Knockout • Hetear Theatres – Other Treating Methods • Chemical – Electrical – Crude Oil Coolers (Heat Exchangers) • Control Valves Principles • Pumps Operation • Air Compressor Operation
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day One

Day 2: Monday, 09th of December 2024

0730 – 0930	Sequence of Desalter Plant Start-up
0930 – 0945	Break
0945 – 1100	Sequence of Desalter Plant Start-up (cont’d)
1100 – 1230	Direct-Fired Heaters Design Considerations – Process & Combustion
1230 – 1245	Break
1245 – 1420	Direct-Fired Heaters (cont’d) Control System
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Two





Day 3: Tuesday, 10th of December 2024

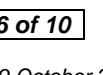
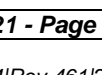
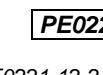
0730 – 0930	Air Coolers <i>Types – Forced and Induced Air • Key Operational Considerations</i>
0930 – 0945	Break
0945 – 1100	Air Coolers (cont'd) <i>Air vs Water Cooling • Troubleshooting</i>
1100 – 1230	Heat Exchangers <i>Types • Shell-and-Tube</i>
1230 – 1245	Break
1245 – 1420	Heat Exchangers (cont'd) <i>Heat Transfer Relation</i>
1420 – 1430	Recap <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow</i>
1430	Lunch & End of Day Three

Day 4: Wednesday, 11th of December 2024

0730 – 0930	Pumps <i>Development of Static and Dynamic Head in the Operating Volume of Pumps for Efficiency and Control Operation • The Affinity Laws as Tools for Efficient Operation • Pump Auxiliaries</i>
0930 – 0945	Break
0945 – 1100	Pumps (cont'd) <i>Wear Components • Canned Motor and Magnetic Drive Pumps • High Speed/Low Flow Pumps • Servicing and Condition Monitoring</i>
1100 – 1230	Compressors <i>Types, Styles and Configurations of Centrifugal and Axial Compressors • Construction Features • Mode of Operation</i>
1230 – 1245	Break
1245 – 1420	Compressors (cont'd) <i>Compressor Auxiliaries and Support Systems • Analyse Operating Curves for Surge, Stall and Choke • Define Appropriate Equipment for Safe Operation</i>
1420 – 1430	Recap <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow</i>
1430	Lunch & End of Day Four

Day 5: Thursday, 12th of December 2024

0730 – 0930	Process Vessels <i>Types and Functions • Safety Aspects</i>
0930 – 0945	Break
0945 – 1100	Valves <i>Valve Theory • Valve Types • Applications • Function • Operation • Troubleshooting</i>
1100 – 1230	Troubleshooting of Different Equipment & Processes

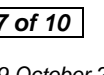
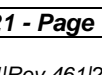
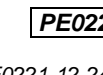
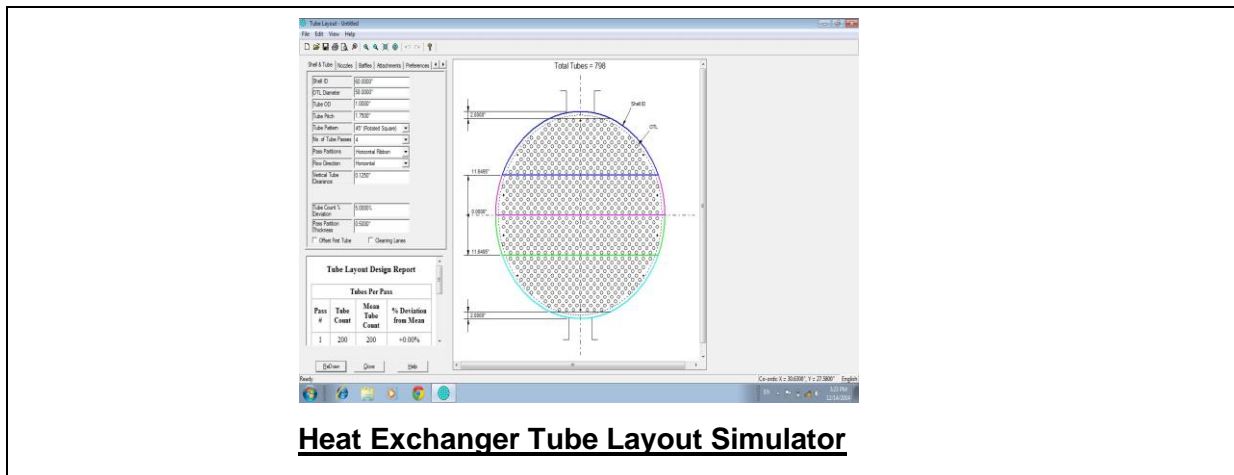


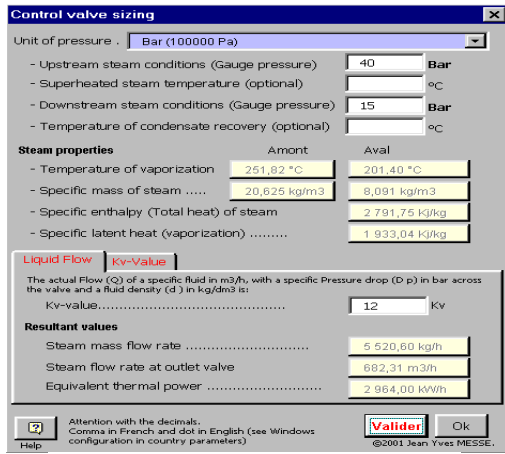


1230 – 1245	Break
1245 – 1345	Troubleshooting of Different Equipment & Processes (cont'd)
1345 – 1400	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

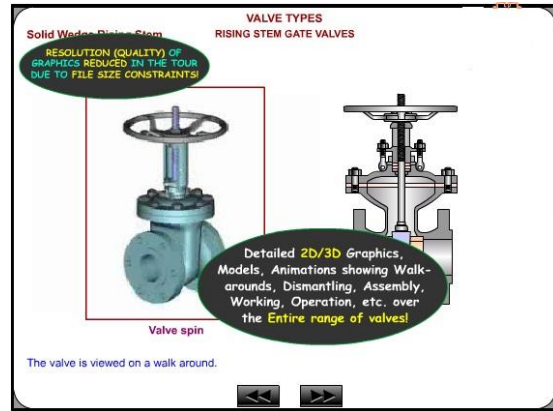
Simulator (Hands-on Practical Sessions)

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 our state-of-the-art simulators “Heat Exchanger Tube Layout”, “Centrifugal Pumps and Troubleshooting Guide 3.0”, “SIM 3300 Centrifugal Compressor”, “CBT on Compressors”, “Valve Sizing Simulator”, “Valve Simulator 3.0”, “Valvestar 7.2 Simulator”, “PRV²SIZE Simulator” and ASPEN HYSYS V12.1” simulator.

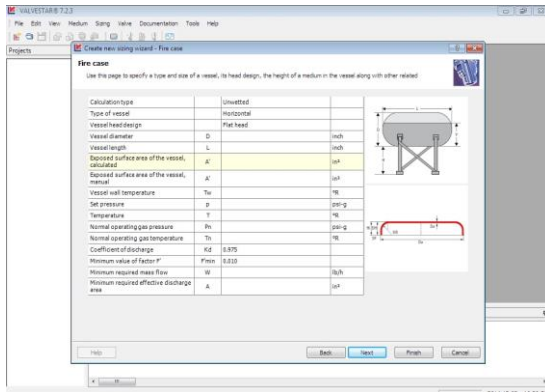




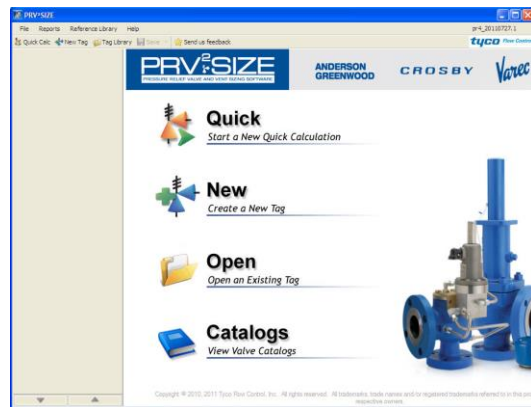
Valve Sizing Simulator



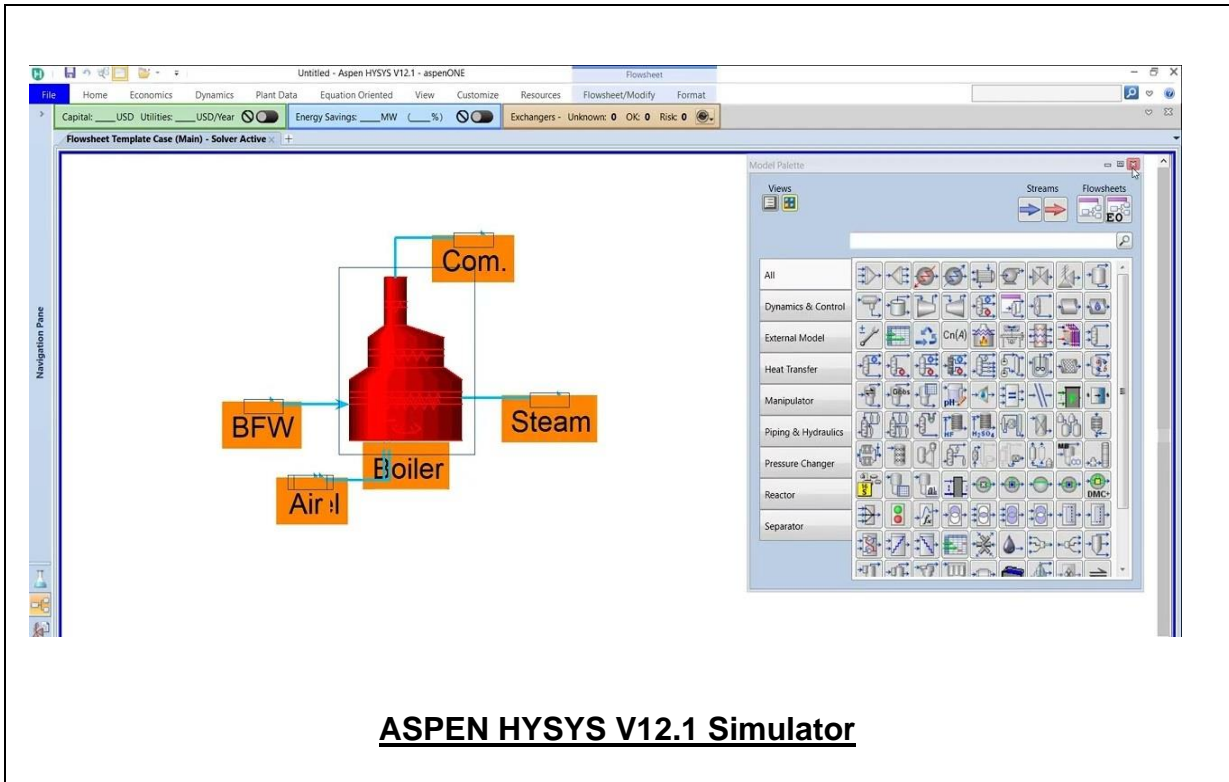
Valve Simulator 3.0



Valvestar 7.2 Simulator



PRV²SIZE Simulator



Book(s)

As part of the course kit, the following e-book will be given to all participants:

<p style="text-align: center;"> OPERATOR'S GUIDE to Rotating Equipment <small>An introduction to rotating equipment construction, operating principles, troubleshooting, and best practices</small> <small>Julien LeBleu, Jr. and Robert Perez</small> </p>	<p>Title : Operator's Guide to Rotating Equipment: An Introduction to Rotating Equipment Construction, Operating Principles, Troubleshooting and Best Practices</p>
	<p>ISBN : 978-1-49690-868-1</p>
	<p>Authors : Julien LeBleu Robert Perez</p>
	<p>Publisher : AuthorHouse</p>

Course Coordinator

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