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
January 21-25, 2024/Safir Meeting Room, Divan Istanbul Sisli, Istanbul, Turkey

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

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 Fee

US$ 6,000 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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 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.

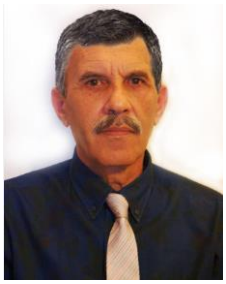
  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation 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.

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. Mike Poulos, MSc, BSc, is a **Senior Process Engineer** with over **35 years** of industrial experience within the **Utilities**, **Refinery**, **Petrochemical** and **Oil & Gas** industries. His expertise lies extensively in the areas of **Process Equipment Design & Troubleshooting**, **Petroleum Processing**, **Process Design Specifications**, **Process Calculation Methods**, **Equipment Sizing & Selection**, **Piping**, **Pumps**, **Compressors**, **Heat Exchangers**, **Air Coolers**, **Direct-Fired Heaters**, **Process Vessels**, **Fractionator Columns**, **Reactors, Ancillary Equipment**, **Mechanical & Safety Aspects**, **Cost Estimation**, **Commissioning & Start-Up**, **Production & Cost Reduction**, Reactor Building Ventilation System, **PVC** Initiators Storage Bunkers, **PVC** Modernization & Expansion, **PVC** Reactor, **PVC** Plant Reactors Pre-Heating, **PVC** Plant Start-Up & Commissioning, **PVC** Plant Shutdown, **PVC** Driers Automation, **VCM** Recovery, **VCM** Sphere Flooding System, **VCM** Storage Tanks, Steam Tripping Facilities, Solvents Plant Automation Commissioning & Start-Up and Inferential Properties System. Further, he is also well-versed in Advanced Process Control Technology, Designing Process Plant Fail-Safe Systems, Quantitative Risk Assessment, On-Line Statistical Process Control, Principles and Techniques of Contemporary Management, Rosemount RS3, Polymer Additives, Polymer Reaction Engineering, Polymer Rheology and Processing, GRID Management and Batch Process Engineering.

During his career life, Mr. Poulos held significant positions as the **Chemical Plants Technology Engineer**, **PVC Plant Production Engineer**, **PVC Plant Shutdown Coordinator**, **PVC Plant/CC Solvents Plants Acting Section Head** and **Chemical Distribution Section Head** from Hellenic Petroleum, wherein he was responsible for the development of integrated system.

Mr. Poulos has **Master** and **Bachelor** degrees in **Chemical Engineering** from the **University of Massachusetts** and **Thessaloniki Polytechnic** respectively. Further, he is a **Certified Instructor/Trainer, a** and a **member** of the **Greek Society of Chemical Engineers** and **Greek Society of Engineers**.

Accommodation

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

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, 21st of January 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***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 22nd of January 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***
1430	*Lunch & End of Day Two*

Day 3: ***Tuesday, 23rd of January 2024***

0730 – 0930	***Air Coolers*** *Types – Forced and Induced Air ● Key Operational Considerations*
0930 – 0945	*Break*
0945 – 1100	***Air Coolers (cont'd)*** *Air vs Water Cooling ● Troubleshooting*
1100 – 1230	***Heat Exchangers*** *Types ● Shell-and-Tube*
1230 – 1245	*Break*
1245 – 1420	***Heat Exchangers (cont'd)*** *Heat Transfer Relation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 24th of January 2024

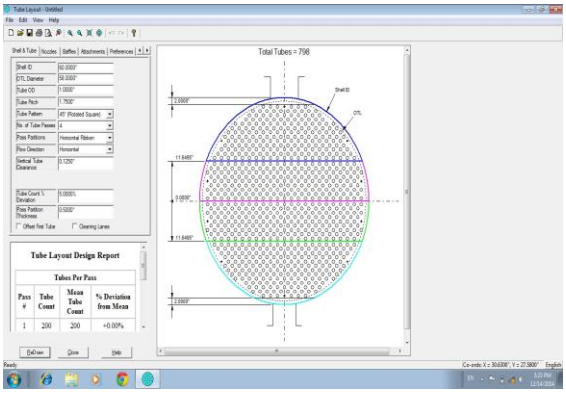
0730 – 0930	***Pumps*** *Development of Static and Dynamic Head in the Operating Volume of Pumps for Efficiency and Control Operation ● The Affinity Laws as Tools for Efficient Operation ● Pump Auxiliaries*
0930 – 0945	*Break*
0945 – 1100	***Pumps (cont'd)*** *Wear Components ● Canned Motor and Magnetic Drive Pumps ● High Speed/Low Flow Pumps ● Servicing and Condition Monitoring*
1100 – 1230	***Compressors*** *Types, Styles and Configurations of Centrifugal and Axial Compressors ● Construction Features ● Mode of Operation*
1230 – 1245	*Break*
1245 – 1420	***Compressors (cont'd)*** *Compressor Auxiliaries and Support Systems ● Analyse Operating Curves for Surge, Stall and Choke ● Define Appropriate Equipment for Safe Operation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Thursday, 25th of January 2024

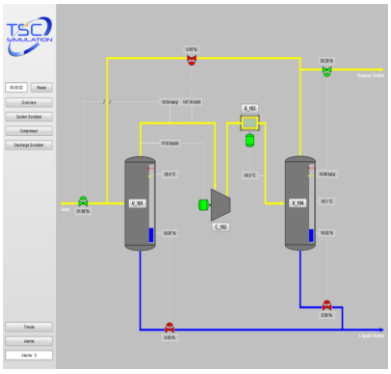
0730 – 0930	***Process Vessels*** *Types and Functions ● Safety Aspects*
0930 – 0945	*Break*
0945 – 1100	***Valves*** *Valve Theory ● Valve Types ● Applications ● Function ● Operation ● Troubleshooting*
1100 – 1230	***Troubleshooting of Different Equipment & Processes***
1230 – 1245	*Break*
1245 – 1345	***Troubleshooting of Different Equipment & Processes (cont'd)***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

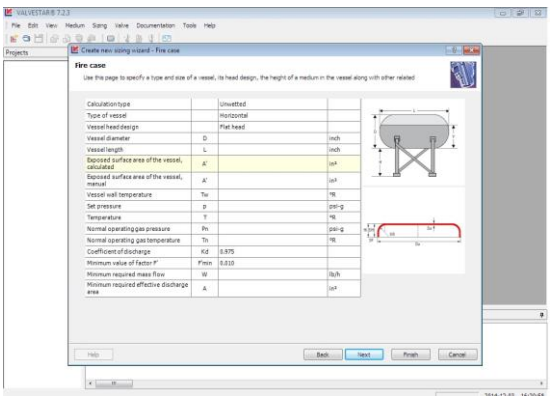
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators "Heat Exchanger Tube Layout", "SIM 3300 Centrifugal Compressor"", "Valvestar 7.2 Simulator", "PRV²SIZE Simulator", and "ASPEN HYSYS V12.1" simulator.



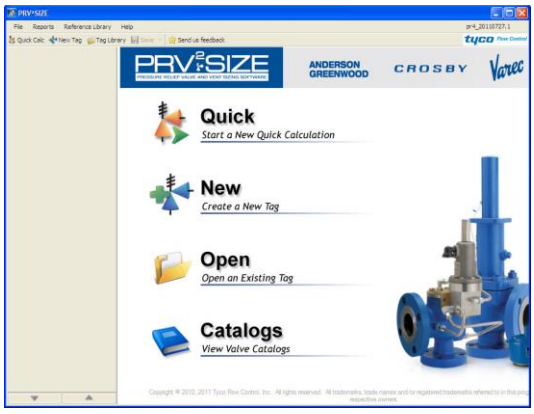
Heat Exchanger Tube Layout Simulator



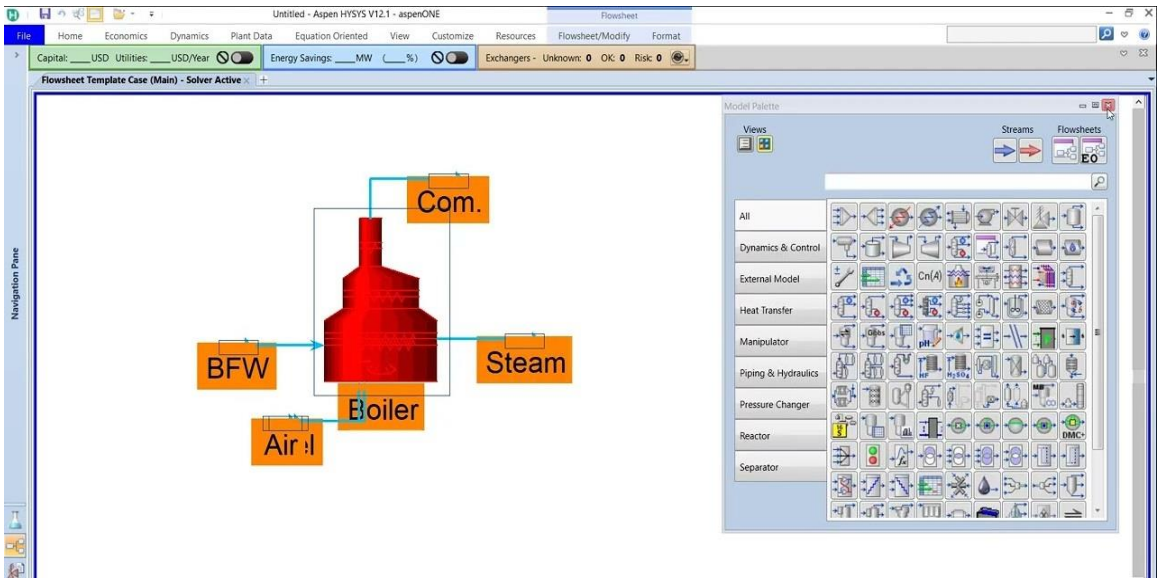
SIM 3300 Centrifugal Compressor Simulator



Valvestar 7.2 Simulator



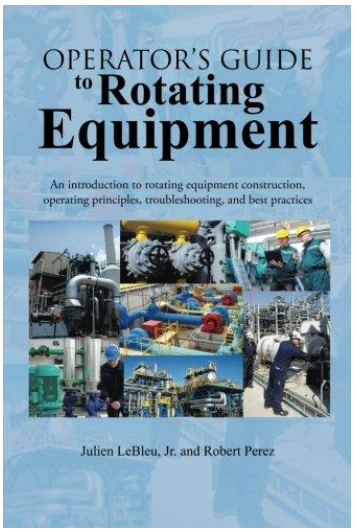
PRV²SIZE Simulator



ASPEN HYSYS V12.1 Simulator

Book(s)

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



Title : Operator's Guide to Rotating Equipment: An Introduction to Rotating Equipment Construction, Operating Principles, Troubleshooting and Best Practices
ISBN : 978-1-49690-868-1
Authors : Julien LeBleu
Robert Perez
Publisher : Author House

Course Coordinator

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