COURSE OVERVIEW PE0263
Operation of Process Equipment
Fired Heaters, Air Coolers, Heat Exchangers, Pumps, Compressors, Pressure Vessels & Valves

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

Course Date/Venue
Please see page 3

Course Reference
PE0263

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 delegates with a detailed and up-to-date overview of operation of process equipment. It covers the objective and equipment layout of process equipment; developing 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, wear components, canned motor and magnetic drive pumps, flow pumps, servicing and condition monitoring; the main features of various types of compressors; the compressors classification based on design and application; the types, styles and configurations of centrifugal and axial compressors; and the main elements of centrifugal compressor construction and efficiency.

During this interactive course, participants will learn the compressor operation; the fin fan cooler including its types, operational efficiency and capacity control; the operation and troubleshooting of cooler; the heaters and their types, construction and operating parameters and inspection/testing requirements; the types and basic parts of furnaces; the fuel gas system of burners, gas burners, oil burners, flame impingement, draft and observations during normal operation; the heat exchangers, process vessels and valves; and the troubleshooting of different equipment and processes.

Course Objectives

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

- Apply and gain an in-depth knowledge on the operation of process equipment
- Discuss process equipment including its objective and equipment layout
- Develop static and dynamic head in the operating volume of pumps for efficiency and control operation
- Discuss the affinity laws as tools for efficient operation, pump auxiliaries, wear components, canned motor and magnetic drive pumps, flow pumps, servicing and condition monitoring
- Explain the main features of various types of compressors, classify compressors based on design and application including world standards and codes related to compressor
- Identify the types, styles and configurations of centrifugal compressors and axial compressors
- Explain the main elements of centrifugal compressor construction and analyze centrifugal compressor efficiency
- Employ guidelines for trouble-free centrifugal compressor operation including troubleshooting, inspection and maintenance
- Operate compressor by analysing curves for surge, stall and choke as well as define appropriate equipment for safe operation
- Recognize fin fan cooler including its types, operational efficiency and capacity control
- Operate and troubleshoot cooler through key operational considerations and proper troubleshooting
- Discuss heaters and their types, construction and operating parameters, inspection/testing requirements
- Identify the types and basic parts of furnaces including their efficient operation and air control
- Analyze the fuel gas system of burners, gas burners, oil burners, flame impingement, draft and observations during normal operation
- Differentiate heat exchangers, process vessels and valves
- Troubleshoot different equipment and processes in a professional manner

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 an overview of all significant aspects and considerations of operation of process equipment for engineers, design engineers, maintenance staff 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 Date/Venue

Session(s)	Date	Venue
1	May 17-21, 2026	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA
2	June 07-11, 2026	Meeting Plus 9, City Centre Rotana, Doha, Qatar
3	July 12-16, 2026	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
4	August 23-27, 2026	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
5	September 27-October01, 2026	Pierre Lotti Meeting Room, Movenpick Hotel Istanbul Golden Horn, Istanbul, Turkey
6	November 02-06, 2026	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain
7	December 20-24, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
8	January 10-14, 2027	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
9	February 08-12, 2027	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
10	March 21-25, 2027	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

Accommodation

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

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

Haward's certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

- 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.

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. Attalla Ersan, PEng, MSc, BSc, is a **Senior Process Engineer** with over **30 years** of extensive experience within the **Oil & Gas**, **Hydrocarbon** and **Petrochemical** industries. His expertise widely covers the areas of **Process Simulation Using Aspen Hysys & UniSim**, **Process Modelling**, **Process Design**, **Process Plant** Operations, **Process Plant Startup & Operating Procedure**, **Ethylene & Vinyl Chloride**, **Ethane Cracking Furnaces** Operations, **Ethylene & Polyethylene** Operation, **Acid Gas Treatment**, **Sulphur Recovery**, **EDC & VCM**, Caustic Soda Storage, Debottle-necking, **Process Operation**, **Safety Audits**, **Process Engineering**, **Root Cause Investigations**, **Pyrolysis Cracking**, **Gas Plant Commissioning**, **Loss Prevention Techniques**, **Occupational Hazards**, Hot Tapping & Tie-Ins, Pre-Start-Up Safety Review (**PSSR**), Standard Operating Procedure (**SOP**), Emergency Operating Procedure (**EOP**), Permit to Work Systems (**PTW**), **Steam Cracking**, **Steam Generation**, **Binary Fractionators** Operations, **Tanks Farm & Metering Station Techniques**, **Gas Treatment**, **Sulphur Recovery Process Unit Operation**, **Permit to Work System**, **Emergency Response Planning**, **Boiler & Steam System** Management, **Waste Heat Recovery**, **Boiler Plant Safety**, **Boiler Controls**, **Steam Distribution** Systems, **Steam Traps**, Pollution Control, Cracked **Gas Compressor**, **Reboilers**, **Sulphur Unit Air Blower**, **Steam Turbine**, **Distillation Columns**, **Gas Treatment**, **Waste & Water Treatment Units**, **Pumps**, **Compressors**, **Turbines**, **Motors**, **Turbo-expanders**, **Gears**, **Heat Exchanger**, Hazard and Operability (**HAZOP**) Study, Process Hazards Analysis (**PHA**), **HAZOP** Facilitation, **Loss Prevention**, Consequence Analysis Application, **Gas Detectors** Operation, **Accident/Incident Investigation (Why Tree Method)**, **Occupational Exposure Assessment**, **Fire Fighting & First Aid**, **Environmental Management** and **Basic Safety** Awareness. Further, he is also well-versed in Project Management, Human Resources Consultancy, Manpower Planning, Job Design & Evaluation, Recruitment, Training & Development and Leadership, Creative Problem Solving Skills, Work Ethic, Job Analysis Evaluation, Training & Development Needs, Bidding & Tendering, Technical Report Writing, Supervisory Leadership, Effective Communication Skills and Total Quality Management (TQM). He is currently the **CEO** of **Ersan Petrokimya Teknoloji Company Limited** wherein he is responsible for the design and operation of Biogas Process Plants.

During his career life, Mr. Ersan has gained his practical and field experience through his various significant positions and dedication as the **Policy**, **Organization & Manpower Development Head**, **Training & Development**, **Head**, **Ethylene Plant – Pyrolysis Furnace Engineer**, **Production Engineer**, Process Training Coordinator, Ethylene Plant Shift Supervisor, Ethylene Plant Panel & Fit Operator, Process Training & Development Coordinator, **Technical Consultant**, and **Instructor/Trainer** for Qatar Vinyl Company Limited and Qatar Petroleum Company (QAPCO).

Mr. Ersan is a **Registered Professional Engineer** and has a **Master's degree** of **Education** in **Educational Training & Leadership** and a **Bachelor's degree** of **Petrochemical Engineering**. Further, he is a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, workshops, conferences and seminars internationally.

Course Fee

Doha	**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.
Al Khobar	**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.
Istanbul	**US$ 6,000** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	**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.
London	**US$ 8,800** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Seville	**US$ 8,800** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Cairo	**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.

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 Process Equipment*** *Process Equipment Objective ● Types of Process Plants ●Process Equipment Layout ● Rotating Equipment ● Stationery Equipment*
0930 – 0945	*Break*
0945 – 1100	***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*
1100 – 1230	***Pumps (cont'd)*** *Wear Components ● Canned Motor and Magnetic Drive Pumps ● High Speed/Low Flow Pumps ● Servicing and Condition Monitoring*
1230 – 1245	*Break*
1245 – 1420	***Compressor Overview*** *Overview of the Main Features of Various Types of Compressors ● Classification of Compressors Based on Design and Application ● World Standards and Codes Related to Compressor Design*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Types of Compressors*** *Types, Styles and Configurations of Centrifugal and Axial Compressors ● Construction Features ● Mode of Operation ● Compressor Auxiliaries and Support Systems*
0930 – 0945	*Break*
0945 – 1100	***Centrifugal Compressor*** *Main Elements of Centrifugal Compressor Construction ● Analysis of Centrifugal Compressor Effeciency ● Guidelines for Trouble-free Centrifugal Compressor Operation*
1100 – 1230	***Centrifugal Compressor (cont'd)*** *Troubleshooting Inspection and Maintenance ● Centrifugal Compressors Anti Surge System and Surge Protection ● Case Studies About Centrifugal Compressors*
1230 – 1245	*Break*
1245 – 1420	***Compressor Operation*** *Analyse Operating Curves for Surge, Stall and Choke ● Define Appropriate Equipment for Safe Operation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Fin Fan Cooler*** *Types ● Operational Efficiency ●Capacity Control*
0930 – 0945	*Break*
0945 – 1100	***Cooler Operating & Troubleshooting*** *Key Operational Considerations ● Air vs Water Cooling ● Troubleshooting*
1100 – 1230	***Heater*** *Heaters and their Types ● Construction & Operating Parameters ● Inspection/Testing Requirements*
1230 – 1245	*Break*
1245 – 1420	***Furnaces*** *Types of Furnaces ● Furnace Basic Parts ● Efficient Operation, Air Control etc*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

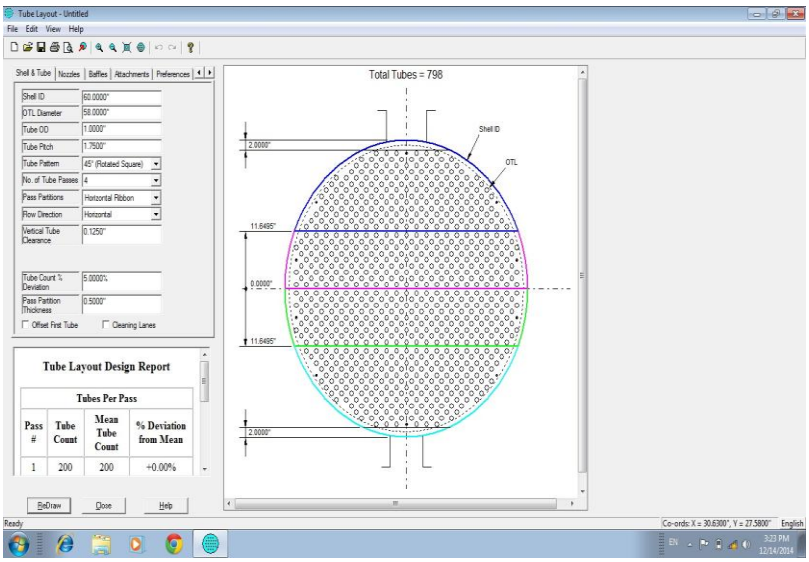
0730 – 0930	***Fuel Gas System*** *Burners ● Gas Burners ● Oil Burners*
0930 – 0945	*Break*
0945 – 1100	***Fuel Gas System (cont'd)*** *Flame Impingement ● Draft ● Observations During Normal Operation*
1100 – 1230	***Heat Exchangers*** *Types ● Shell-and-Tube*
1230 – 1245	*Break*
1245 – 1420	***Heat Exchangers (cont'd)*** *Heat Transfer Relation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

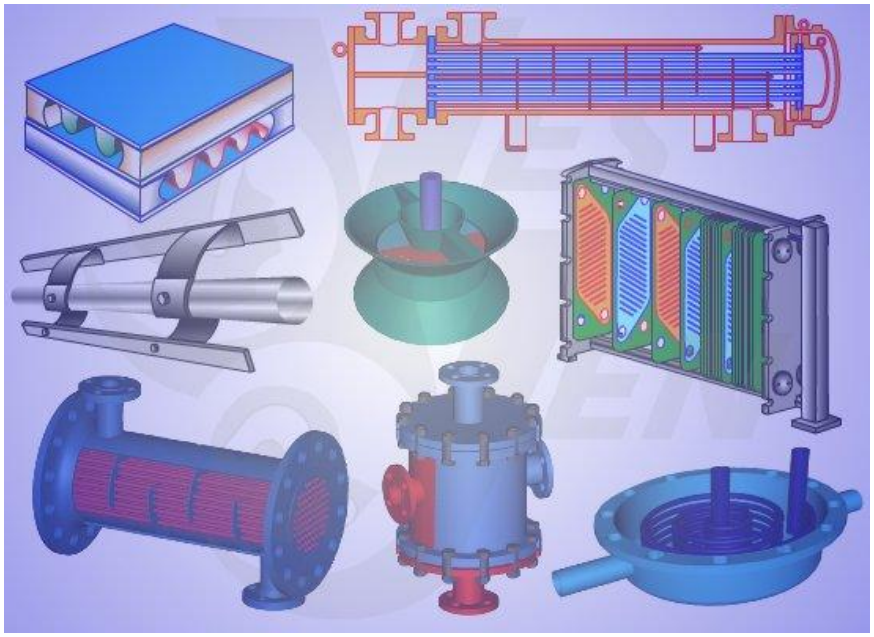
0730 – 0930	***Process Vessels*** *Types and Functions ● Safety Aspects*
0930 – 0945	*Break*
0945 – 1215	***Valves*** *Valve Theory ● Valve Types ● Applications*
1215 – 1230	*Break*
1230 – 1245	***Valves (cont'd)*** *Function ● Operation ● Troubleshooting*
1245 – 1345	***Troubleshooting of Different Equipment & Processes***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

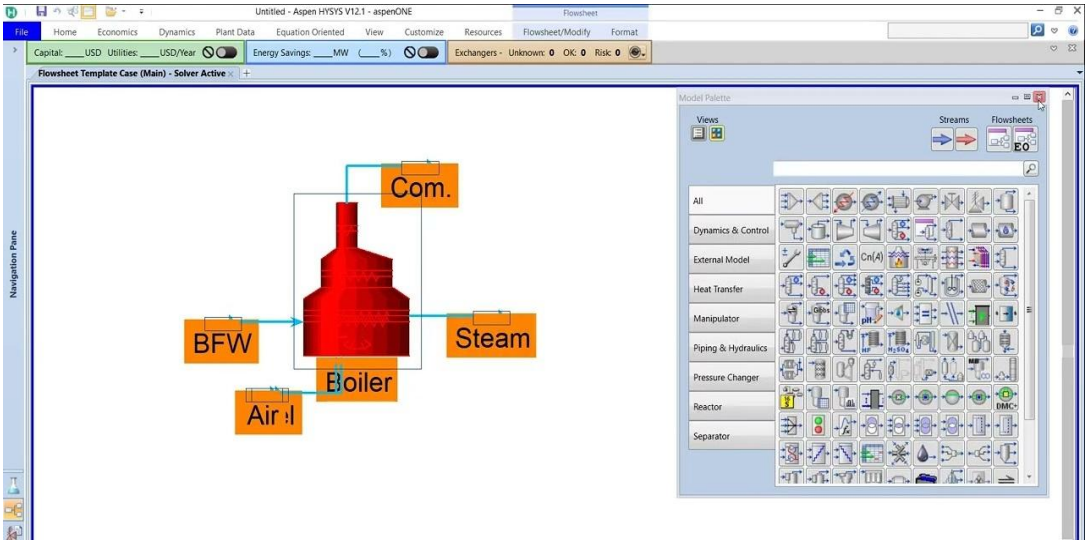
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators "Heat Exchanger Tube Layout"," Heat Exchanger CBT", "ASPEN HYSYS V12.1" simulator, "Centrifugal Pumps and Troubleshooting Guide 3.0", "SIM 3300 Centrifugal Compressor", "CBT on Compressors", "Valve Sizing Simulator", "Valve Simulator 3.0", "Valvestar 7.2 Simulator" and "PRV²SIZE Simulator"



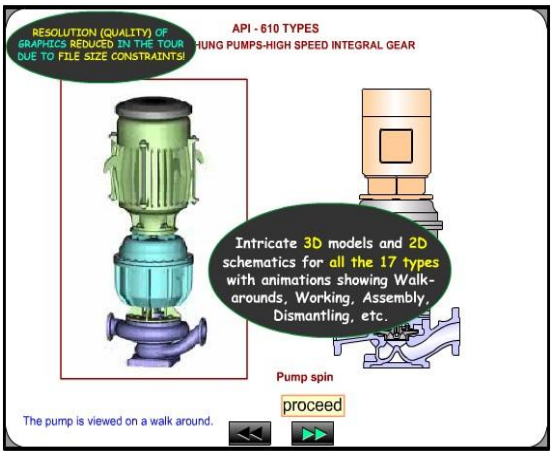
Heat Exchanger Tube Layout Simulator



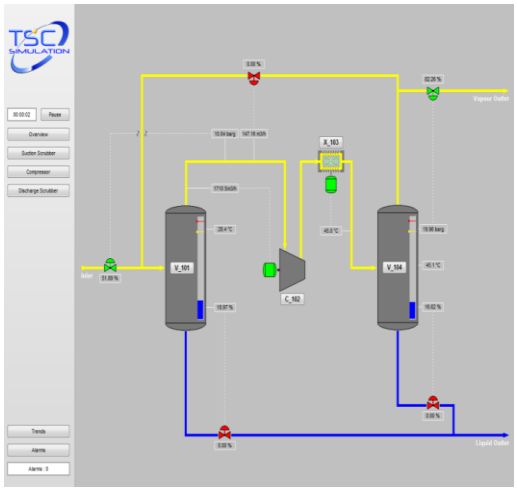
Heat Exchanger CBT



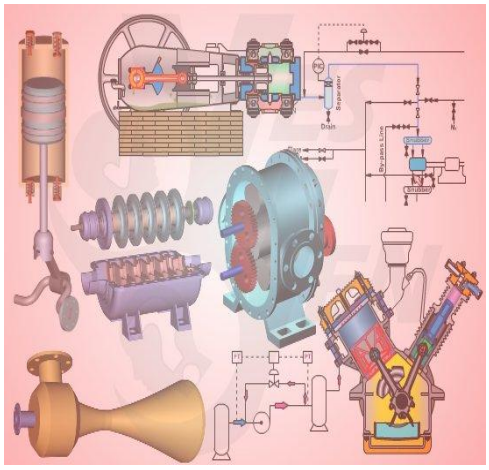
ASPEN HYSYS V12.1 Simulator



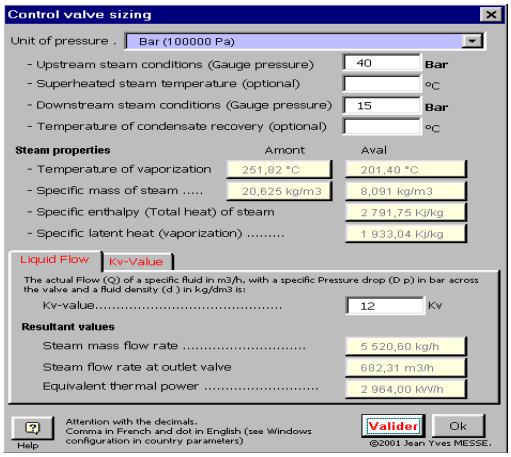
Centrifugal Pumps and Troubleshooting Guide



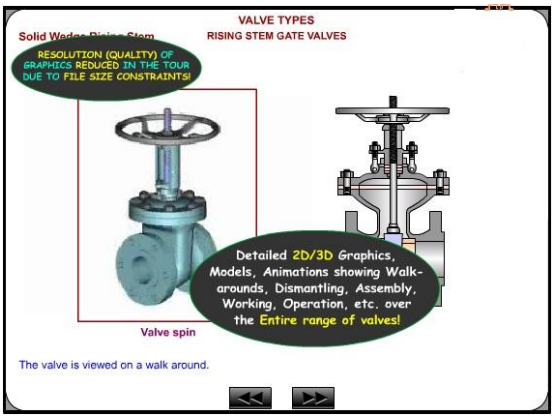
SIM 3300 Centrifugal Compressor Simulator



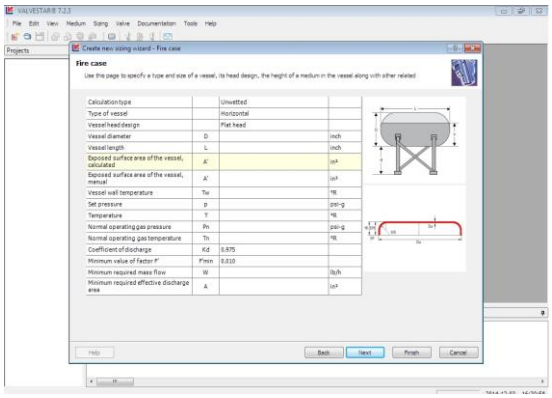
CBT on Compressors



Valve Sizing Simulator



Valve Simulator 3.0

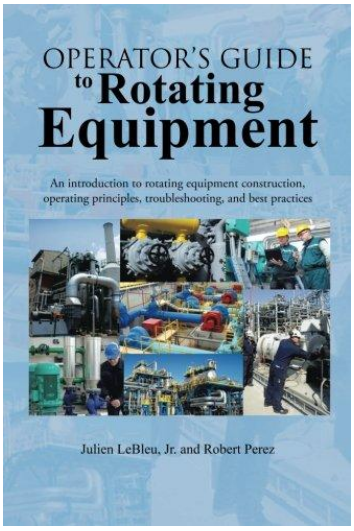


Valvestar 7.2 Simulator

PRV²SIZE Simulator

Book(s)

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



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 : AuthorHouse

Course Coordinator

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