

COURSE OVERVIEW PE0281(QA1)-4D

Reciprocating & Screw Compressors (Production Perspective)

Course Title

Reciprocating & Screw Compressors
(Production Perspective)

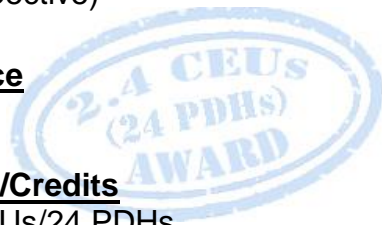
Course Reference

PE0281(QA1)-4D

Course Duration/Credits

Four days/2.4 CEUs/24 PDHs

Course Date/Venue



Session(s)	Date	Venue
1	September 09-12, 2024	Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA
2	December 16-19, 2024	Boardroom, Warwick Hotel Doha, Doha, Qatar

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 reciprocating and screw compressors. It covers the various types of compressors and the principles of gas compression; the effect of staging, stage and interstage cooling; and the positive displacement compressors, reciprocating compressor cycle, compressor valves and compressor capacity control.



During this interactive course, participants will learn the proper techniques in starting-up, running, maintaining and shutting down the reciprocating and screw compressors; the latest applications and operating principles of the reciprocating and screw compressors; and determining their capacity control and performance.

Course Objectives

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

- Apply proper operating techniques of reciprocating and screw compressors
- Discuss the various types of compressors and employ the principles of gas compression
- Identify the effect of staging, stage and interstage cooling and recognize the positive displacement compressors, reciprocating compressor cycle, compressor valves and compressor capacity control
- Employ the proper techniques in starting-up, running, maintaining and shutting down the reciprocating and screw compressors
- Use the latest applications and operating principles of the reciprocating and screw compressors and determine their capacity control and performance

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 course conveniently saved in a **Tablet PC**.

Who Should Attend

This course is designed for engineers, supervisors, technicians and operators who are responsible for the operation of reciprocating and screw compressors.

Course Fee

Al Khobar	US\$ 4,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Doha	US\$ 5,000 per Delegate. 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 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:-

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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 **2.4 CEUs** (Continuing Education Units) or **24 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 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. Den Bazley, PE, BSc, is a **Senior Engineer** with over **25 years** of industrial experience within **Oil, Gas, Petrochemical** and **Power** industries. His specialization widely covers **Reciprocating & Screw Compressors, Distillation Column Operation & Control, Oil Movement Storage & Troubleshooting, Process Equipment Design, Applied Process Engineering Elements, Process Plant Optimization, Revamping & Debottlenecking, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Monitoring, Catalyst Selection & Production Optimization, Operations Abnormalities & Plant Upset, Process Plant Start-up & Commissioning, Clean Fuel Technology & Standards, Flare, Blowdown & Pressure Relief Systems, Oil & Gas Field Commissioning Techniques, Pressure Vessel Operation, Gas Processing, Chemical Engineering, Process Reactors Start-Up & Shutdown, ASME B31 Piping & Pipeline Design, Construction, Operation, Inspection, Pigging, Maintenance, Repair & Integrity Assessment, Process Equipment, Maintenance Management, Reliability Management, Reliability Centred Maintenance (RCM), Total Plant Maintenance (TPM) and Reliability-Availability-Maintainability (RAM), Engineering Drawings, Codes & Standards, P&ID Reading, Interpretation & Developing**. His experience covers **Design, Construction and Maintenance of Storage Tank, Hydraulic Control Valves, Rotating and Static Equipment including Safety Relief Valves, Boilers, Pressure Vessels, Tanks, Heat Exchangers, Bearings, Compressors, Pumps, Pipelines, Motors, Turbines, Gears, Lubrication Technology and Mechanical Seals**. Further, he has experience in Waste Water Treatment, **Water Treatment, Welding, NDT, Vehicle Fleet and Budgeting & Cost Control**. He is well-versed in **CMMS** and various International Standards including ISO 14001.

During his career life, Mr. Bazley has gained his practical and field experience through his various significant positions and dedication as the **General Manager, Branch Manager, Refinery Chairman, Engineering Manager, Maintenance Engineer, Construction Engineer, Project Engineer, Mechanical Engineer, Associate Engineer, Oil Process Engineer, Mechanical Services Superintendent, Quality Coordinator, Planning Coordinator, Consultant/Instructor, Lecturer/Trainer and Public Relations Officer** for numerous international companies like **ESSO, FFS Refinery, Dorbyl Heavy Engineering (VECOR), Vandenberg Foods (Unilever), Engen Petroleum, Royle Trust and Pepsi-Cola**.

Mr. Bazley is a **Registered Professional Engineer** and has a **Bachelor's degree in Mechanical Engineering**. Further, he is a **Certified Engineer** (Government Certificate of Competency GCC Mechanical Pretoria), a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management (ILM)**, an active member of the **Institute of Mechanical Engineers (IMechE)** and has delivered numerous trainings, courses, seminars and workshops internationally.

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 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	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Compressor Types <i>Positive Displacement-Reciprocating, Rotary • Dynamic-Centrifugal, Axial</i>
0930 – 0945	<i>Break</i>
0945 – 1030	Principles of Gas Compression
1030 – 1230	Effect of Staging, Stage & Interstage Cooling
1230 – 1245	<i>Break</i>
1245 – 1420	Positive Displacement Compressors
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0930	Reciprocating Compressor Cycle
0930 – 0945	<i>Break</i>
0945 – 1100	Effect of Staging
1100 – 1230	Oil Free Cylinders–Floating Pistons
1230 – 1245	<i>Break</i>
1245 – 1345	Condensation
1345 - 1420	Liquid Slugs
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

0730 – 0930	Reciprocating Compressor Valves–Valve Response
0930 – 0945	<i>Break</i>
0945 – 1100	Reciprocating Compressor Capacity Control
1100 – 1230	Performance Considerations

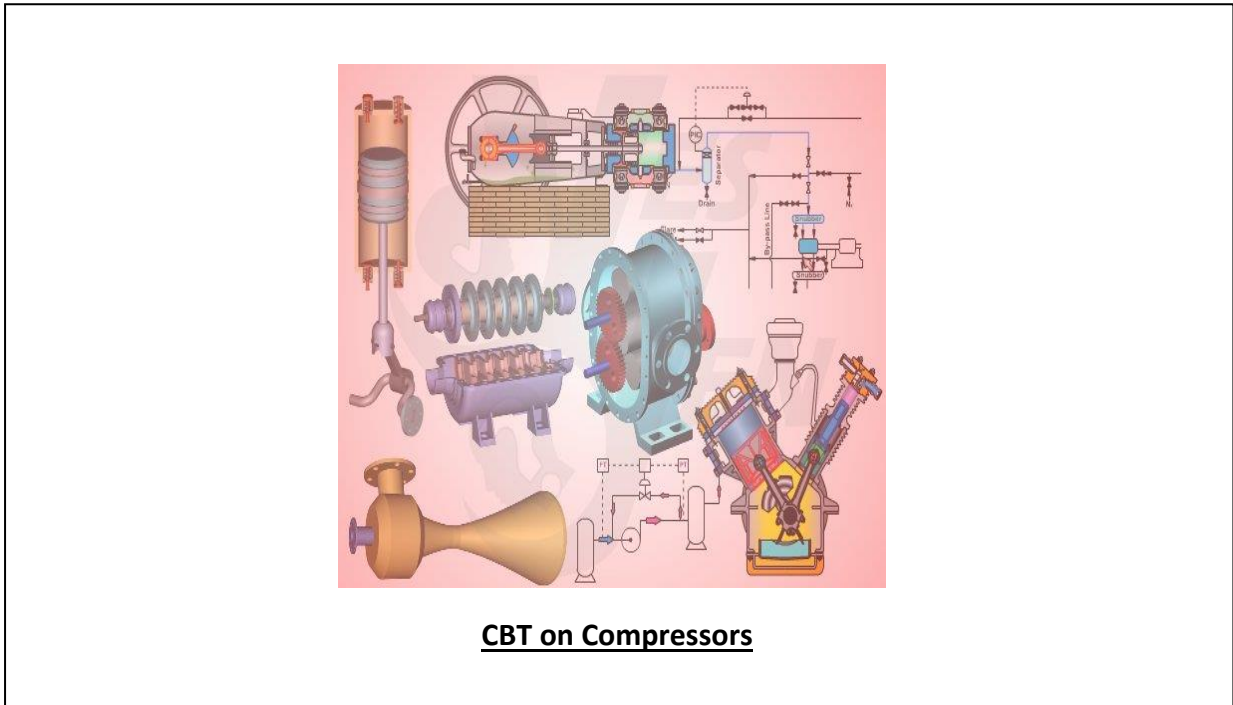
1230 - 1245	Break
1245 - 1345	Starting up, Running, Shutting Down
1345 - 1420	Gas Pulsations-Reduction of Pulsations
1420 - 1430	Recap
1430	Lunch & End of Day Three

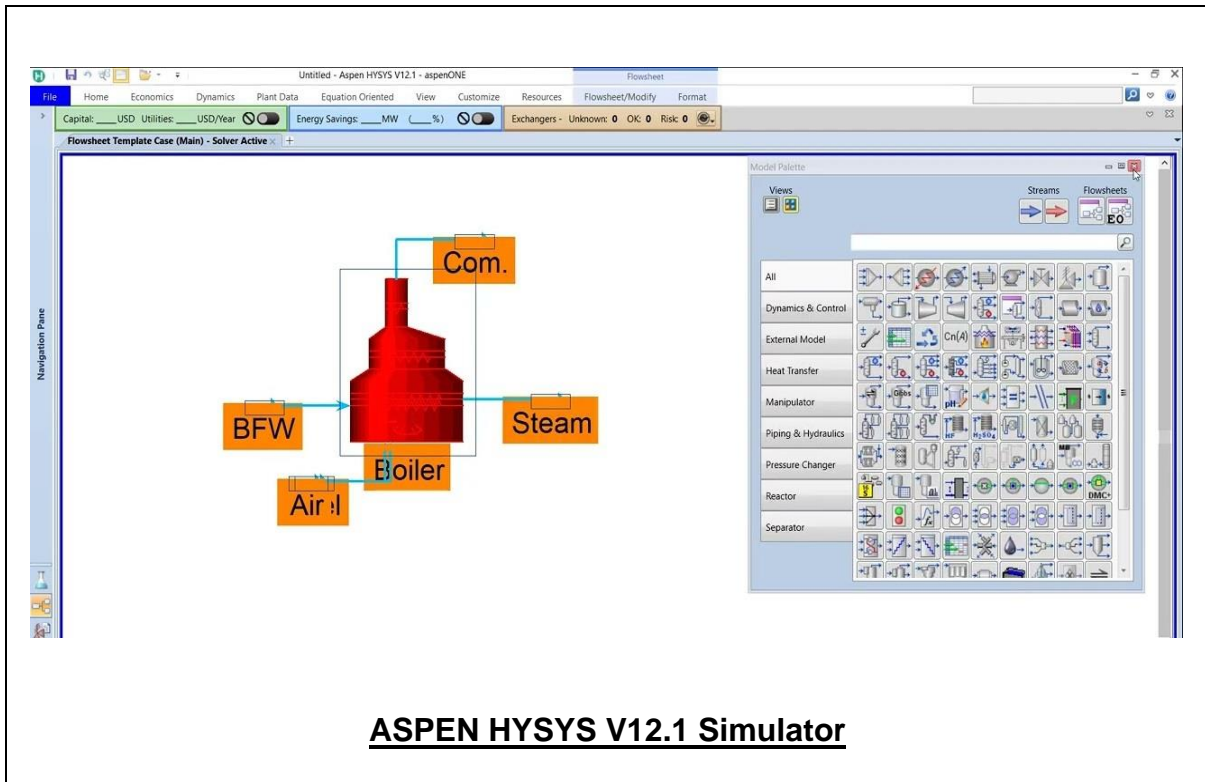
Day 4

0730 - 0830	Screw Compressors
0830 - 0930	Areas of Application
0930 - 0945	Break
0945 - 1045	Operating Principles
1045 - 1230	Capacity Control
1230 - 1245	Break
1245 - 1345	Performance
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 the simulators “CBT on Compressors” and “ASPEN HYSYS” simulator.





ASPEN HYSYS V12.1 Simulator

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org

