



COURSE OVERVIEW PE0281(QA1)

Reciprocating & Screw Compressors (Production Perspective)

Course Title

Reciprocating & Screw Compressors
(Production Perspective)

Course Date/Venue

November 15-19, 2026/TBA Meeting Room,
Centro Corniche Al Khobar by Rotana, Al
Khobar, KSA

Course Reference

PE0281(QA1)

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 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/Outcomes & Benefits for the Participants

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 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.

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.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

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.



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.

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 **Reciprocating & Screw Compressors**: Operation, Performance & Troubleshooting, **Industrial Compressors**: Operation, Maintenance & Troubleshooting, **Compressor Performance**, Reliability & Optimization, **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**, **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**, **Certified Process Plant Operations**, **Control & Troubleshooting**, **Operator Responsibilities**, **Storage Tanks Operations & Measurements**, **Process Plant Troubleshooting & Engineering Problem Solving**, **Process Plant Performance**, **Efficiency & Optimization**, **Process Troubleshooting Techniques**, **Oil & Gas Operation/Introduction to Surface Facilities**, **Pressure Vessel Operation**, **Process Equipment Performance & Troubleshooting**, **Plant Startup & Shutdown**, **Startup & Shutdown the Plant While Handling Abnormal Conditions**, **Flare & Relief System**, **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)**, **Tank Design**, **Construction**, **Material Cataloguing**, **Specifications**, **Handling & Storage**, **Steam Trap Design**, **Operation**, **Maintenance & Troubleshooting**, **Steam Trapping & Control**, **Column**, **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: Sunday, 15th of November 2026

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Compressor Types Positive Displacement-Reciprocating, Rotary • Dynamic-Centrifugal, Axial
0930 – 0945	Break
0945 – 1030	Principles of Gas Compression
1030 – 1230	Effect of Staging, Stage and Interstage Cooling
1230 – 1245	Break
1245 – 1420	Positive Displacement Compressors
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Monday, 16th of November 2026

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

Day 3: Tuesday, 17th of November 2026

0730 – 0930	Liquid Slugs
0930 – 0945	Break
0945 – 1100	Reciprocating Compressor Valves-Valve Response
1100 – 1230	Reciprocating Compressor Capacity Control
1230 – 1245	Break
1245 – 1420	Performance Considerations
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4: Wednesday, 18th of November 2026

0730 – 0930	Gas Pulsations-Reduction of Pulsations
0930 – 0945	Break
0945 – 1100	Starting up, Running, Shutting Down
1100 – 1230	Screw Compressors
1230 – 1245	Break
1245 – 1420	Areas of Application
1420 – 1430	Recap
1430	Lunch & End of Day Four

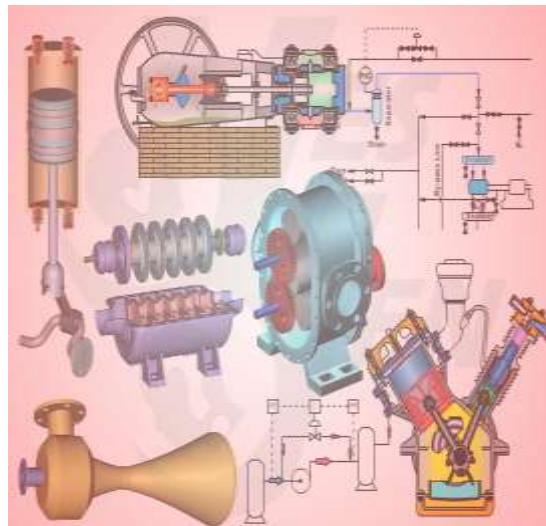


Day 5: Thursday, 19th of November 2026

0730 – 0830	<i>Operating Principles</i>
0830 – 0930	<i>Capacity Control</i>
0930 – 0945	<i>Break</i>
0945 – 1230	<i>Performance</i>
1230 – 1245	<i>Break</i>
1245 – 1345	<i>Performance (cont'd)</i>
1345 – 1400	<i>Course Conclusion</i>
1400 – 1415	<i>POST-TEST</i>
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 simulators “CBT on Compressors”.



CBT on Compressors

Course Coordinator

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