COURSE BROCHURE

Gas Compression Stations: Operation and Performance

An applied course on gas compression stations covering centrifugal and reciprocating compressors, their drivers and station auxiliary systems, with performance calculations, surge protection and condition monitoring.

Code	HT-OGE-129
Category	Oil & Gas, Engineering & Maintenance
Duration	1 week
Level	Intermediate

Introduction

Compression stations sit at the heart of gas transmission networks, gas lift schemes and reservoir injection projects, and when they stop, production or supply stops with them. They are also among the heaviest fuel users on any asset, so every point of lost compressor efficiency becomes a daily operating cost.

Objectives

- Calculate compression ratio, head, power and discharge temperature for a given compression duty
- Select a compressor type and driver suited to the application and its range of operating conditions
- Read a centrifugal compressor performance map and locate the operating point and surge margin
- Explain reciprocating compressor capacity control methods and rod load limits
- Evaluate performance degradation from operating data and separate mechanical causes from process causes

Who should attend

- Compression station engineers and operators
- Rotating equipment and mechanical maintenance engineers
- Process engineers in gas facilities and transmission pipelines
- Instrumentation and control engineers working on anti-surge systems

Skills you will develop

- Compressor performance calculations
- Reading performance maps and PV diagrams
- Operation of station auxiliary systems
- Condition monitoring and troubleshooting

Learning Outcomes

- Calculate a compressor's polytropic efficiency from pressure and temperature readings and compare it with the manufacturer's curve
- Locate the operating point relative to the surge line and control line and propose action when it approaches them
- Interpret a PV diagram of a reciprocating cylinder and tell valve leakage from piston ring leakage
- Set a safe operating envelope for a station running compressors in series or in parallel

Course Outline

Day 1: Gas Compression Fundamentals and Compressor Selection

- Isentropic and polytropic compression and calculation of head, power and discharge temperature
- Compression ratio, number of stages and intercooling
- Centrifugal, reciprocating and screw compressors and where each fits in gathering, transmission, injection and gas lift

Day 2: Centrifugal Compressors and Their Drivers

- Main components, the performance map, and the surge and stonewall limits
- Anti-surge system: recycle valve, control line and system response time
- Dry gas seals and the lube oil system, gas turbines and variable speed electric motors

Day 3: Reciprocating Compressors

- Cylinders, valves and rod packing, rod load and rod reversal
- Capacity control: clearance pockets, valve unloaders, speed variation and recycle
- Pulsation and vibration, pulsation bottles and PV diagrams, and gas engine drivers

Day 4: Station Systems and Operation

- Suction scrubbers, filters and air-cooled aftercoolers, and the effect of liquid carryover on the compressor
- Emergency shutdown, blowdown, fuel gas and seal gas systems
- Series and parallel operation, load sharing and start-up and shutdown sequences

Day 5: Performance Monitoring, Reliability and Workshop

- Field performance testing, efficiency trending and the effect of fouling and internal wear
- Condition monitoring: vibration, valve and bearing temperatures and analysis of repeat failures
- Applied workshop in which participants calculate polytropic head and efficiency from field data, compare them with the map and define the operating envelope

Training methodology

Calculation exercises on head, power and discharge temperature
Reading centrifugal compressor performance maps and plotting operating points on them
Failure cases: repeated surge, valve failures and dry gas seal leakage
Closing workshop evaluating a compressor from station data

Certification

Participants receive a Harbor Training Center certificate of attendance on completing the course.

Upcoming dates

City	Dates	Language	Fee
Istanbul	19 – 23 April 2027	AR-EN	EUR 5,400
Dubai	26 – 30 April 2027	AR-EN	EUR 4,800
London	3 – 7 May 2027	AR-EN	EUR 5,800
Amsterdam	10 – 14 May 2027	AR-EN	EUR 6,100
Online	17 – 21 May 2027	AR-EN	EUR 2,800
Istanbul	18 – 22 October 2027	AR-EN	EUR 5,400
Dubai	25 – 29 October 2027	AR-EN	EUR 4,800
London	1 – 5 November 2027	AR-EN	EUR 5,800

Fees are per participant.

Contact us

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To register and for details, scan the code or visit:

https://harbor4training.com/en/courses/gas-compression-stations