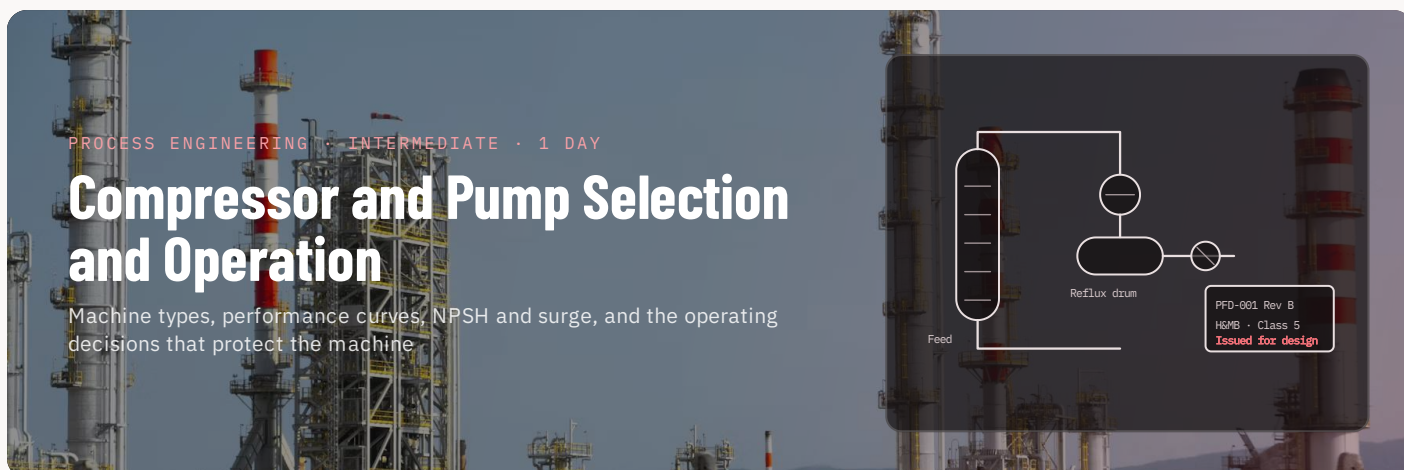



DURATION
 1 day

LEVEL
 Intermediate

FORMAT
 On-site classroom · virtual instructor-led

LANGUAGE
 English

MAX. PARTICIPANTS
 16

- 5
performance-curve exercises
- 2
surge and NPSH case studies
- 1
selection checklist per machine type

Overview

A pump or compressor is the one item of equipment where the process engineer's data sheet and the operator's actions interact every minute. The course covers selection between centrifugal, reciprocating and screw machines, reading performance curves, NPSH, minimum flow, surge and anti-surge control, and the process conditions — gas composition, suction pressure, parallel operation — that push machines outside their envelope.

Learning outcomes

- Select pump and compressor types for a duty from process conditions and turndown requirements
- Read and apply performance, head-capacity and surge curves to actual operating cases
- Calculate NPSHa and minimum-flow requirements and specify the protection needed
- Explain surge, anti-surge control and the effect of molecular-weight and suction changes
- Specify a machine using API 610 / 617 / 618 data sheets and recognise the key clauses
- Recognise operating problems — cavitation, recycle, parallel-machine instability — from trends

Who should attend

Process and rotating-equipment engineers, operations engineers and supervisors responsible for pumps and compressors; project engineers writing specifications

Course outline

MORNING

Pump types and selection · centrifugal pump curves, system curves, affinity laws · NPSH, cavitation and minimum flow · reciprocating and PD pumps · parallel and series operation · API 610 data sheet essentials · sealing and seal plans overview (API 682)

AFTERNOON

Compressor types: centrifugal, reciprocating, screw · head, polytropic efficiency and gas property effects · surge, stonewall and anti-surge control · performance-curve exercises and MW change case · API 617 / 618 specification essentials · operating and trending: start-up, load sharing, degradation · troubleshooting cases

Standards referenced

API 610 API 617 API 618 API 682 API 670
 GPSA Engineering Data Book

Tools & exercises

Curve and performance exercises worked by hand and in the client's simulator or vendor selection tool

What's included

- ✓ Course manual and slide pack
- ✓ Software access for the course
- ✓ Post-course Q&A with the instructor
- ✓ Exercise and case-study pack
- ✓ Competency quiz and certificate
- ✓ Templates used in the exercises

PREREQUISITES

Process or mechanical engineering background

CERTIFICATION

Certificate of completion

INSTRUCTORS

Practising engineers — TÜV HAZOP Leader, CCPSC and IEC 61511 Functional Safety certified — with 200+ years of cumulative plant experience.