

DESIGN, CONSTRUCTION, CONTROL & OPERATION OF RECIPROCATING COMPRESSORS (REF:OTSRC0001)

Course Objectives

To be able to understand the design, construction, control and operation of Reciprocating Compressors.

Course Description

This course offers delegates a comprehensive overview of the design, construction, control and operation of reciprocating compressors of the type normally found in the oil, gas and other process industries.

The course describes the principles of operation of the compressor and how, through a combination of the physical constraints both on the gas being processed and the materials of construction of the compressor, the design is adapted to a number of different configurations to meet numerous needs.

The effect of changing the gas composition and suction conditions is studied through the use of a dynamic simulation model.

The course also offers delegates the opportunity to study the manner in which the compressor is controlled and operated to provide a safe, effective means of boosting the pressure of a gas stream for a number of applications. A Computer Based Training (CBT) package is used to perform performance, efficiency and simple design calculations.

Who Should Attend

Operations personnel of a non-mechanical background who are either supervisors or persons responsible for the day-to-day operation and maintenance of reciprocating compressor installations. This includes process operators, supervisors, technicians and Engineers who do not have a mechanical background. No prior knowledge of the subject is required although some fundamental understanding of gas behaviour is desirable.

Pre-Requisites

All Attendees should have a sound power generation and mechanical background.

Course Outcome

At the end of this course you will be able to design centrifugal and reciprocating compressors.

Course Outline

Day 1

Introduction

Compressor selection

Efficiencies

Speed

Centrifugal versus reciprocating

Principles of the Compression Process

Day 2

1st & 2nd Law of thermodynamics

Isothermal, Adiabatic, Isentropic and Polytropic Compression

Compression cycles

Theory of Operation

Valves, Cylinders, Pistons

Clearance volume

Single acting compressors

Double acting compressors

Volumetric and Mechanical Efficiency and Multi-staging Design

Principles

Calculations



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Day 3

Compressor operation

Effect of changes in suction pressure, suction temperature and gas composition
Discharge temperature limits (API 618)

Compressor Cylinder Assembly

Frame Assemblies and Compressor Configurations
Balanced opposed compressors

Cooling and Lubrication

Day 4

Capacity Control

Unloaders
Clearance pockets and bottles
Step control
Recycle control

Performance & Design calculations

Volumetric efficiency
Volumetric throughput
Multi-stage compression ratio
Discharge temperature
Piston rod loading
Compression power

Day 5

Case Studies and Compression Applications

Course Review and Feedback

