# Key Points for Compressors & Turbines Operation & Inspection

**5 days** **MTE/KPCTOI**

## Overview

### LEVEL

Skilled

### PURPOSE

This course provides basic knowledge of the performance, technology and operation of compressors and turbines.

### LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:
recognize the different types of compressors and turbines and their main applications,
explain operating principles and key performances of these equipment,
describe their technology and the main operating constraints.

### WAYS AND MEANS

Use of drawings, datasheets, pictures and videos of actual equipment.
Interactive lecture.
Industrial case studies.

### LEARNING ASSESSMENT

Quiz.

### PREREQUISITES

No prerequisites for this course.

## Agenda

### GAS COMPRESSION — 0.5 d

Thermodynamics: isentropic and actual compression, discharge temperature and compression power forecastings.

### RECIPROCATING & ROTARY POSITIVE DISPLACEMENT COMPRESSORS — 1.5 d

Different types of positive displacement compressors.
Reciprocating compressor architecture: number of stages, cylinders, overall layout, typical applications.
Technology of main components and ancillaries.
Influence of process conditions on compressor performance: suction or discharge pressure, suction temperature, gas composition.
Flow control, specific safety devices. Start-up procedures. Troubleshooting.
Key points for general inspection.

### CENTRIFUGAL COMPRESSORS — 1 d

Description of different type of compressors: horizontal/radial split casing centrifugal compressors, axial compressors, integrated gear compressors.
Technology of main components and auxiliaries.

Pressure increase process for a compressor stage. Performance curves, influence of suction conditions and gas composition.
Operating window: low and high speed limits, stonewall, surge, typical anti surge protection systems.
Flow control: throttling valve, speed control, inlet guide vanes. Specific precautions for start-up.
Troubleshooting. Safety.
Key points for general inspection.

## TURBINES

**2 d**

Gas expansion thermodynamics; application to steam and gas turbines.
Description of different turbines, different families, standard applications.
Steam turbines, gas turbines, turbo-expanders technology.
Gas and steam turbines operation and performance.
Start-up and performance monitoring. Speed control, safety devices.
Key points for general inspection.