

# Training - Pumps Operation



PUMPOP-EN-P



Face-to-face only



5 days

This course provides a better understanding of centrifugal and positive displacement pumps technology and operating principles

## Level

Skilled

## Public

- Engineers and technicians involved in centrifugal and positive displacement pump operation or engineering
- Employees in charge of running and checking pumping system

## Objectives

Attendees will be able to implement the following skills:

- Describe the behavior and the operation of pumps
- Analyze the technical solutions applied in their units
- Establish a diagnosis of the incidents and participate in the troubleshooting meetings
- Identify essential elements in pump selection

## Pedagogical & technical resources

- Functional approach for a better understanding
- Numerous examples and cases studies from the Oil & Gas production industry and analysis of manufacturer file

## Assessment of achievements

Written test upon training course completion

## Prerequisites

No prerequisites are necessary to follow this course

## Responsible

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

## Program

### PUMPING PREREQUISITES

0.5 day

Pump performance:

- Hydraulic pumping fundamentals.
- Pressure, flowrate, specific gravity, friction losses, centrifugal force, height/pressure relation, mechanic and hydraulic power, vapor pressure curve, energy conservation.
- Pump choice and typical upstream implementations.

### TECHNOLOGY & PERFORMANCE

2 days

Centrifugal pumps:

- Functional approach: study step by step of the main functions; process (impeller, wear rings, balancing, pump body shape...); sealing: mechanical sealing, typical arrangements (single, dual, dry seal), selection according API 382 standard, materials, type, friction face heating; support (axial and radial, thrust and journal bearings); lubrication (oil and grease...); monitoring (rotor displacement, vibrations, temperature, pressure...).
- Building step by step a monocellular centrifugal pump.

Positive displacement pumps:

- Different types of pumps: rotary and reciprocating pumps.
- Operating principle and utilization of the different types of pumps.
- Influence of clearance, internal leaks, nature of product on flow rate and pressure.
- Flow rate control.
- Installation guidelines: position of tanks, line diameters, metering drums, pulsation dampeners, pressure valves.

Particular choices:

- Coupling and driven machines.
- ATEX: material consequences.

## OPERATION & MONITORING

1.5 days

Preparation: filling, draining; spare pumps: heating, ancillaries.

Start-up/shutdown: priming, controls, hammer shock, risks for process and pump.

Surveillance: parameters (vibration levels, noises, bearing housing temperature, motor intensity, pressures); impact of stream parameters; hazards.

Parallel and series operations: risks, dysfunction.

## TROUBLESHOOTING

0.75 day

Troubleshooting of most frequent problems (cavitation, priming situation, low flowrate...).

## SAFETY IN OPERATION

0.25 day

Leaks, vibrations, feed, overcharge...

Analysis of industrial incidents and accidents.

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.

Please contact our disabled persons referent to check the accessibility of this training program : [referent.handicap@ifptraining.com](mailto:referent.handicap@ifptraining.com)