# Training - Distillation - Optimization and Troubleshooting

DSS-EN-P | Face-to-face only | 5 days

This course provides a comprehensive understanding of efficient distillation columns operation as well as optimization strategies implementation

## IFP Training Certificate

Advanced Certificate

## Level

Expert

## Public

Engineers, process engineers, process control personnel and technical staff in the refining and petrochemicals industries

## Objectives

Attendees will be able to implement the following skills:

- Know about all parameters and profiles for the analysis of a distillation column operation
- Master the concepts necessary to optimize the operation of a column
- Identify the performances and limits of different control systems
- Detect deficiencies, find their origin and solutions

## Pedagogical & technical resources

- Highly efficient learning process: operation of a virtual column using a dynamic simulator that models the main physical phenomena of distillation
- Troubleshooting case studies to illustrate process control schemes
- The content of the exercises can be customized to the needs and specific features of the client site
- Parts of or whole session adaptable to virtual classroom

## Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives, including an handling situation of operation to find the settings for tuning a column

## Prerequisites

No prerequisites are necessary to follow this course

## Responsable

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


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## OPERATING PARAMETERS: DEFINITION & SIGNIFICANCE — 0.5 day

Material balance of the virtual column: cut point, separation quality and concept of fractionation capability.
Column pressure: pressure control and pressure profile along the column.
Heat balance. Reflux and reboiling ratio and selectivity assessment.
Internal flow rates profiles, concentration and temperature profiles. Concentration peaks.

## FRACTIONATION CAPABILITY OF AN INDUSTRIAL DISTILLATION COLUMN — 0.5 day

Impact of the parameters related to the fractionation capability:

- Liquid-vapor internal flow rates, associated with reflux and reboiling ratios.
- Number of theoretical stages and internal equipment efficiency.
- Position of feedstock inlet related to feed characteristics.

Fractionation capability and related energy consumption.
Each item is illustrated by practical exercises conducted by trainees on a dynamic simulator.

## PROCESS CONTROL PARAMETERS — 3 days

The simulator handling scenario covers the different aspects of operation and control of columns. It starts with a simple control system and implements increasingly sophisticated control systems on increasingly complex columns: from binary to a multiple draw-off column (crude oil distillation).
Survey of operating disturbances; origins and causes.
Process control strategy and optimization targets.
External or internal reflux control, reboiling control with flow rates or duty monitoring.
Material balance control: sensitive tray, temperature control systems.
Optimization of the heat balance: additional energy through the feed or the reboiler, low pressure operation and energy savings.
Implementation of more complex control systems.
Analysis of disturbances caused by the feed and systems for feed forward control.
Implementation of process control in multi-column trains.
Specific case of multiple draw-off columns:

- Quality tuning through material balance (temperature, flow rate or level control).
- Heat balance monitoring (role of pumparounds and vaporizing refluxes, optimization of the fractionation capability).
- The participants can provide diagrams of their distillation columns, the methodology will be applied to confirm that a change of operating parameter does not have the same consequence according to the control scheme implemented.

## EQUIPMENT TECHNOLOGY & TROUBLESHOOTING — 1 day

Trays: technology; high efficiency trays, performance and flexibility.
Packings and distribution systems: flooding, fouling, mechanical damage and remedies.
Reboilers and condensers: implementation and working principles, various control strategies, problems and related origins, possible solutions.
The items in this chapter are exemplified by case studies corresponding to actual industrial problems and related solutions.

# Sessions

**Rueil-Malmaison** - From 06/15/2026 to 06/19/2026 — **4360 €/HT**

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


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