# Training - Heavy Oil Production and Processing

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

This course aims to acquire a comprehensive knowledge and practical know-how of the production and field processing of heavy crude oil

## Level
Skilled

## Public
Production, field or process engineers involved in heavy oil production

## Objectives
Attendees will be able to implement the following skills:

- Describe heavy oil fundamental properties, main reservoir production mechanisms and the adapted techniques
- Explain the reasons for upgrading heavy crude oils, assess the various problems induced by unwanted compounds
- Master oil and water treatment processes, operations and related operating conditions
- Understand the role of different units in a heavy crude upgrading chain
- Acquire a good understanding of the operation of the units related to extra heavy crude oil processing

## Pedagogical & technical resources
Highly interactive training course delivered by industry experts and adapted to participants' experience

## 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

## 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

### DRIVE MECHANISMS — 0.25 day

Primary recovery. Secondary recovery: water flooding, gas injection, solvent displacement using naphtha, DCO, DRU. Classic EOR methods: miscible gas injection, chemical flooding. Thermal EOR methods: Cyclic Steam Stimulation (CSS), Steam-Assisted Gravity Drainage (SAGD), In Situ Combustion (ISC), Toe-to-heel air injection.


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## WELL PERFORMANCE — 0.25 day

Needs for artificial lift. Viscosity reduction: dilution/blending, heating, emulsification through the formation of an oil-in-water emulsion, pour point reduction by using Pour Point Depressant (PPD). Forecast production of heavy crudes including behavior of horizontal wells.

## COMPLETION ADAPTED TO HEAVY OIL PRODUCTION — 0.25 day

Cold production. Hot production: cyclic steam stimulation, steam assisted gravity drainage.

## NEED FOR OIL FIELD PROCESSING - QUALITY REQUIREMENTS — 0.25 day

Quality requirements of crude oils. Needs for upgrading heavy crude oils. Examples of compositions of commercialized crude oils.

## CRUDE OIL TREATMENT — 1.5 days

Crude stabilization (gas removal) by Multi Stage Separation (MSS): operating parameters (number of separation stages, pressures, heating and cooling needs...); influence on the quantity and quality (API grade) of the produced oil; foaming problems and main available solutions; associated gas recovery.
Crude dehydration (water removal) and desalting: emulsion problems in heavy crude oil production and impact of well production techniques on surface facilities; asphaltenes management in surface facilities; dehydration processes for heavy crude oils; heavy crude oil desalting.
Acid crude sweetening (H2S removal): principle of stripping, stripping of heavy crude oils.
Diluent recovery unit, diluent recovery assessment and maximum recovery diluent.
Asphaltenes precipitation in storage.

## PRODUCTION WATER TREATMENT — 0.25 day

Main treatments. Operating principle and required performances. Comparison of the different available techniques. Selection criteria. Examples of production water treatment block flow diagrams.

## INJECTION WATER TREATMENT — 0.25 day

Reasons for water injection. Quality requirements and necessary treatments. Main operating conditions of each treatment and required performances. Examples of injection water treatment block flow diagrams.

## UPGRADER PRINCIPLES & OBJECTIVES — 0.25 day

Production, fluidification and transportation of extra heavy crude oils. Different ways to upgrade heavy crude oils. Overview of an upgrader, role and purposes of the different processes.

## ATMOSPHERIC & VACUUM DISTILLATION — 0.25 day

Upgrader distillation units: principles of distillation, capacity, process flowsheets. Atmospheric and vacuum distillation unit: operating conditions, material balance, energy consumption and heat recovery. Corrosion and corrosion prevention in atmospheric and vacuum distillation units.

## UPGRADER HYDROTREATMENTS TO PROCESS NAPHTHA & DISTILLATE — 0.5 day

Hydrotreatment chemical reactions and hydrogen consumption. Hydrotreatment processes: process flow diagram, operating conditions, products characteristics.

## THERMAL CONVERSION UNITS: VISBREAKING & DELAYED COKING — 0.25 day

Heavy cuts thermal conversion processes. Visbreaking. Delayed coking process.

## OTHER CONVERSION PROCESSES — 0.25 day

Deasphalting units: vacuum residues structure and properties; deasphalting principles: different deasphalting solvents, overall flow sheet, operating conditions; integration of deasphating units in conversion schemes.


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## INTEGRATION OF UPGRADING PROCESS WITH SUBSURFACE & SURFACE PRODUCTION

**0.5 day**

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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