

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

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

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.

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 deasphalting units in conversion schemes.

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