

Training - Oil and Gas Process Simulation



SIMUL-EN-P



Face-to-face only



5 days

This course provides a comprehensive knowledge of all field treatments, and develops practical skills in simulation of Oil & Gas treatment processes using the software HYSYS™ and PRO/II™

Level

Knowledge

Public

Process design engineers involved in conceptual design, basic or detailed engineering of Oil & Gas field treatment processes

Objectives

Attendees will be able to implement the following skills:

- Understand Oil & Gas processing operations: flash separation, compression, expansion, heating or cooling, mixing, pumping, etc.
- Grasp common Oil & Gas processing schemes and operating parameters
- Build a Process Flow Diagram (PFD) and optimize existing processing schemes
- Simulate an industrial unit at different operating stages
- Extract thermodynamics data from the simulation software database (phase envelope, critical point parameters, hydrate formation risk area, different physical properties...)

Pedagogical & technical resources

- Highly interactive training by industry-specialist lecturers
- Several simulation case studies, addressing most of Oil & Gas field treatments
- Extensive practice of PRO/II™ and HYSYS™ simulation software

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

SOFTWARE PRESENTATION

0.25 day

Presentation of the different pieces of equipment: pumps, compressors, heat exchangers, turbines, turbo expanders, separators, valves, pipes.

Choice of the thermodynamic model: PR, SRK...

Definition of components, pseudo-components, heavy cuts.

SIMULATION OF A CRUDE OIL FIELD TREATMENT UNIT

1 day

Main field treatments for crude oils: stabilization, sweetening, desalting and dehydration, associated gas compression and treatment.

Study of an offshore crude oil field treatment unit, based on Multiple Stage Separation (MSS).

Influence of the number of separators on the quality (API°, RVP...) and quantity of stabilized oil.

Optimization of the operating parameters: pressures and temperatures of separators, suction and discharge condition of compressors, pumping needs for export by pipe.

Identification and adjustment of the controlling parameters.

SIMULATION OF A NATURAL GAS FIELD TREATMENT UNIT

1 day

Main field treatments for natural gases: dehydration, sweetening, LNG extraction/recovery, compression and export...

Study of an offshore natural gas dehydration, liquids extraction and compression unit.

Optimization of the operating parameters: primary separator operating conditions, dehydration parameters, cooling temperature for a sufficient liquid extraction, compression needs upstream the export pipe.

Identification and adjustment of the controlling parameters.

Analysis of hydrate formation risks.

SIMULATION OF A GAS DEHYDRATION UNIT BY PHYSICAL ABSORPTION (TEG)

0.75 day

Simulation of the glycol loop: contactor, flash separator, regenerator (still), circulation pumps, glycol/glycol exchanger.

Adjustment of controlling parameters: dry gas residual moisture content versus purity of lean TEG, moisture flow to be removed versus TEG circulation flow.

SIMULATION OF A NATURAL GAS LIQUIDS (NGL) EXTRACTION/RECOVERY UNIT

0.75 day

Progressive build up of the PFD of a Natural Gas Liquids (NGL) extraction unit.

Three processes are studied:

- External refrigeration loop (cryogenic loop).
- Joule Thomson expansion valve.
- Turbo Expander.

Illustration of the results on phase envelope diagram.

SIMULATION OF A PROPANE CRYOGENIC LOOP

0.75 day

Study of a simple loop.

Improvement of loop performances by addition of an intermediate expansion.

Use of propane enthalpy diagram to validate the software results.

Influence of propane purity and consequences of air ingress.

SIMULATION OF NATURAL GAS LIQUID FRACTIONATION UNIT - DISTILLATION PROCESS

0.5 day

Principle of separation by distillation process and main operating parameters.

Simulation of a LNG fractionation unit using distillation columns.

Characteristics and operating conditions of the main equipment. Specific constraints.

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