Training - Module 1: Thermodynamics Applied to Well Effluent Processing

ADV1-EN-P | Face-to-face only | 5 days

This course provides a thorough understanding of thermodynamics principles underlying operation and design of Oil & Gas processing facilities

Level
Skilled

Public
Engineers involved in operating or designing Oil & Gas field processing facilities

Objectives
Attendees will be able to implement the following skills:

- Describe Oil & Gas well effluents composition, properties and characteristics
- Grasp ideal gas law, real fluid behavior and characterization methods
- Explain liquid-vapor equilibrium of pure substances and mixtures
- Master the operating principles and performances of mixture separation processes
- Perform simulations with PRO/II™ and master the fundamentals of equations of state

Pedagogical & technical resources

- Highly interactive training with industry-specialist lecturers
- Numerous applications and illustrations
- Extensive practice of PRO/II™ process 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

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

WELL EFFLUENT — 0.75 day

Constitution and physical states of matter.
Constituents of well effluents: hydrocarbons, impurities, water, sediments...

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Different types of effluents: black oil, light oil, volatile oil, condensate gas, dry gas...
Characterization parameters: GOR, CGR, BSW, WOR, water cut, Bo, Bg, B'g...
Examples of compositions of crude oil and natural gas effluent.

LIQUID-VAPOR EQUILIBRIUM OF PURE SUBSTANCES — 1.25 days

Vapor pressure curves.
Overall phase diagram of a pure substance (three dimensions: P, T and V).
Enthalpy diagrams of pure substances.
Exercises: vapor pressure and boiling points of pure components; vapor pressure and boiling point; case of a column.
PRO/II™ simulation: propane cryogenic loop; operating parameters optimization; effect of ambient conditions.

LIQUID-VAPOR EQUILIBRIUM OF MIXTURES - MIXTURE SEPARATION PROCESSES — 2 days

Phase envelopes.
PRO/II™ simulation: phase envelope of well effluents, sales gas, stabilized crudes.
Well effluents behavior from pay zone to surface processing facilities.
PRO/II™ simulation: evolution of the effluent behavior in a well.
Techniques applied to mixture separation: flash process, distillation process.
Absorption and stripping phenomena.
PRO/II™ simulation: LPG recovery by physical absorption; mixture separation by distillation (LPG splitter).

IDEAL GAS & REAL FLUID BEHAVIOR — 0.5 day

Ideal gas behavior.
Behavior of real fluids: compressibility factor, Amagat's law, law of corresponding state with two and three parameters.
Equations Of State (EOS): conception, uses, examples, selection.

HEAT TRANSFER, HEAT BALANCE & THERMAL EQUIPMENT — 0.5 day

Fundamentals of heat transfer.
Heat balance.
Technology of heat exchangers and air coolers.
Examples of thermal equipment applications.

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

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