

## Module 2: Oil & Water Processing

### Sizing - Simulation - Operation

5 days

ADV2-EN-P

#### Overview

#### LEVEL

Skilled

#### PURPOSE

This course provides a comprehensive understanding of oil and water treatment processes, operation and troubleshooting.

#### LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

- list various problems that can be induced by unwanted elements and compounds in crude oil streams,
- master oil and water treatment processes, operations and related operating conditions,
- design main equipment used for oil processing,
- troubleshoot main operating problems encountered in oil and water processing and related solutions,
- simulate crude oil treatment processes using the PRO/II™ software,
- describe technology, operating principles and maintenance of storage tanks.

#### WAYS AND MEANS

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

#### LEARNING ASSESSMENT

Assessment by test at the end of the course.

#### PREREQUISITES

To attend Module 1 or engineer degree or equivalent experience in Oil & Gas industry.

### Agenda

#### NEED FOR OIL FIELD PROCESSING - QUALITY REQUIREMENTS

0.25 d

Constituents raising problems for storage, transport, or crude oil sale.  
Different specifications and quality requirements of crude oils.  
Necessary treatments to reach these specifications.  
Examples of compositions of commercialized crude oils.

#### CRUDE OIL TREATMENT

2.75 d

Crude stabilization by Multi Stage Separation (MSS):  
Process principle.  
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 recompression - Typical associated gas compression schemes.

Applications: practice of separator summary design methods.

PRO/II™ simulation: study of the influence of separation stage number on the performances of a MSS process.

Crude dehydration and desalting:

Emulsion problems.

Main dehydration processes.

Crude oil desalting.

Applications: practice of desalter summary design methods.

Acid crude sweetening (H<sub>2</sub>S removal):

Cold stripping: origin of stripping gas, need for sweetening of stripping gas.

Hot stripping.

Applications: practice of stripping column summary design methods.

PRO/II™ simulation: simulation of a crude oil stripping units case study.

Case study: simulation of a whole crude oil field treatment plant; study of an offshore crude oil field treatment unit, based on a Multiple Stage Separation ( MSS ) process scheme; optimization of the operating parameters.

## STORAGE EQUIPMENT

0.5 d

Atmospherics tanks.

Case of floating storage vessels (FSO, FPSO).

Maintenance and operation.

## PRODUCTION WATER TREATMENT

0.5 d

Regulations for disposal.

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

1 d

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.