Field Processing & Surface Production Facilities
Effluent Treatment & Equipment Technology

**Overview**

**LEVEL**
Foundation

**PURPOSE**
This course provides a comprehensive understanding of onshore and offshore Oil & Gas field processing techniques, along with knowledge of technology and operating principles of surface production facilities equipment.

**LEARNING OBJECTIVES**
Upon completion of the course, participants will be able to:
- grasp fundamentals of Oil & Gas production techniques,
- explain operating principles and conditions of oil, water and gas treatment,
- detail the technology of main equipment and specificities of offshore production techniques,
- ascertain fundamentals of process control, draw a typical safety system layout,
- explain main metering techniques, corrosion issues, its prevention and monitoring.

**WAYS AND MEANS**
Very interactive training by industry specialists.
Numerous applications and illustrations.

**LEARNING ASSESSMENT**
Assessment by test at the end of the course.

**PREREQUISITES**
No prerequisites for this course.

**Agenda**

**WELL EFFLUENTS BEHAVIOR**
Different types of well effluent. Main characterization parameters. Liquid/vapor equilibrium of pure substances and mixtures. Effluent behavior. Constituents that pose problems for storage, transport or commercialization. Main specifications to conform with and required treatments.

**FUNDAMENTALS OF RESERVOIR & DRIVE MECHANISM**

**FUNDAMENTALS OF DRILLING, COMPLETION & WELL PERFORMANCE**
WELL EFFLUENT TRANSPORTATION, FLOW-ASSURANCE & GAS HYDRATES PREVENTION
Gathering network design and operation: main flow assurance issues; multiphase flow, flow patterns; hydrates formation prevention strategies, hydrates inhibition.
Case studies: gas condensate field development; deep-offshore production.

CRUDE OIL PROCESSING
Crude sweetening (H₂S removal).
Examples of oil treatment and associated gas compression process schemes.

PRODUCTION & INJECTION WATER TREATMENT
Quality requirements for production water. Environment related constraints.
Main produced water treatments: API oil-water separators, plate separators, flotators, hydrocyclones…
Reasons for water injection.
Quality requirements and necessary treatments: chlorination, filtration, oxygen removal, sulfate removal.
Examples of process schemes for production and injection water treatment.

GAS PROCESSING & CONDITIONING
Gas dehydration: TEG units, solid desiccants (molecular sieves) units. Gas sweetening. Acid components (H₂S and CO₂) removal: amine units, molecular sieves, membranes. Natural Gas Liquids (NGL) extraction: use of cryogenic refrigeration, Joule-Thompson expansion, turbo-expander.

LIQUEFIED NATURAL GAS
Fundamentals of Liquefied Natural Gas (LNG) chain.

CASE OF OFFSHORE DEVELOPMENTS

ROTATING MACHINERY

THERMAL EQUIPMENT
Heat exchangers, air coolers, furnaces: types, operation, technology.

FUNDAMENTALS OF CORROSION
Different types of corrosion, prevention and monitoring.

ELECTRICAL SYSTEMS - INSTRUMENTATION & PROCESS CONTROL - SAFETY SYSTEMS

METERING & ALLOCATION