



THE CHEMICAL ENGINEERING MAJOR

Crude Oil Treatments

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Introduction

Oil wells generally, produce a mixture of hydrocarbon oil, water, gas, and even sand or solid material with dissolved minerals usually including a large amount of salt & other gases like hydrogen sulfide (H₂S); and solids, including sand from the reservoir, dirt, scale, and corrosion products from the tubing.

Foreign material, such as water and sand must be separated from the oil and gas before they can be sold. This process is known as Crude Oil Treating.

The purpose of Crude Oil treatment is to separate, remove, or transform these various components to make the liquid hydrocarbons (Crude Oil) ready for sales & send to refiners.

This BTS training course provides an overview of all the theories and technologies involved in crude oil treatment, starting with brief about Petroleum Crude Formation, Production, phase separation process, emulsion theory formation, crude oil desalting, stabilization and the mechanism through the technology to destabilize and separate water from oil in addition to crude oil storage and loading facilities.

Due to environmental regulations, the produced water must also be treated. This BTS training course will provide a brief of the processes & operational conditions needed to achieve the required specifications for the produced water.

Upon successful completion of this BTS training course, participants will gain knowledge & full understanding of crude oil treatment from A to Z (formation till loading to refiners) with extensive focus in Oil Treatment Operation. **This BTS training course will feature:**

- Crude Oil Formation, accumulation & Production
- Crude Oil Composition & Characteristics
- Phase Separation Process (Two & Three-Phase Separation)
- Emulsion Formation & Treatment
- Crude Oil Dehydration
- Crude Oil Desalting
- Crude Oil Stabilization & Sweetening
- Crude Oil Storage, Loading & Other Field Facilities
- Produced Water Treatment & Disposal

Training Objectives

What are the Goals?

By the end of this BTS training course, participants will have learned and experienced practical applications of:

- Recognize the theory of crude oil formation, accumulation & production
- Understand the Crude Oil compositions & Characteristics
- Practical understanding of field treating facilities fundamental
- The properties and behavior of crude oil that govern production processing operations
- Learn techniques of Field processes for treating and conditioning full well stream production for sales or final disposition including separation, dehydration, desalting stabilization, storage & Loading
- Gaining good understanding of the purpose and internal workings of all types of surface facilities and treating equipment

Target Audience

Who is this Training Course for?

This BTS training course is suitable to a wide range of professionals but will greatly benefit:

- Field Service / production Operators, Senior Operators & Supervisors
- Operation Foremen and Team leaders
- Plant Engineers, field engineers & New engineers
- Maintenance Planners and Coordinators
- All field maintenance personnel (Multi crafts) those interested to understanding what they maintain

Training Methods

How will this Training Course be presented?

- The training course will be reinforced by a learning mix that includes, lecture style presentation, training videos, open discussion, case studies, simulations and group work
- This BTS training course includes interactive sessions with questions, discussions and problem solving under supervision along with group exercises
- It will be conducted as an interactive workshop that encourages participants to share their own experiences and apply the program material to real-life situations

Organisational Impact

It's well known that competency of the organization employees determines its growth.

- Excellent opportunity to expand the knowledge base of the trained employees which positively will impact on their work
- Employees gain more skills; they tend to immediately apply them to their role
- If employees feel that they are growing and learning in their job, they are more likely to stay at their company (more stability)
- It makes a business / or organization attractive to prospective employees

Personal Impact

- The employee will be competent to handle surface facilities equipments operational tasks
- Competent employees will save time & effort by taking better actions in the right time to solve his operation problems
- The employees will better understand their job which resulted in more satisfaction
- If employees have some weaknesses in some work skills it should be improved
- Training should guarantee better performance for employees

Daily Agenda

Day One: Petroleum Crude from Formation to Production

- Formation and Accumulation of Petroleum Crude
- Types of Petroleum Reservoir
- Drilling the Oil Well.
- Producing the Oil Well.
- Composition and Characteristics of Petroleum Crude
- Field Service Equipments.

Day Two: Phase Separation Process

- Two-Phase Gas–Oil Separation
- Methods of Separation
- Gas–Oil Separation Equipment
- Three-Phase Oil–Water–Gas Separation
- Horizontal Three-Phase Separators
- Vertical Three-Phase Separators
- Separation Theory

Day Three: Emulsion Treatment and Dehydration

- Oil Emulsions
- Dehydration/Treating Processes
- Heating
- Chemical Treatment
- Electrical Aid
- Chemi-electric Dehydrators (Emulsion Theaters)

Day Four: Desalting of Crude Oil

- Description of The Desalting Process
- Relationship among Volume of Remnant Water, Its Salinity and Salt Content
- Electrostatic Desalting
- Determining Dilution Water Requirement
- Effect of Operating Parameters
- Desalter System Trouble Shooting

Day Five: Crude Oil Stabilization, Sweetening & Storage

- Stabilization Operations
- Types of Stabilizer Employing Energy as a Stripping Agent
- Crude Oil Sweetening
- Overview about Crude Storage Tanks
- Vapor Recovery Units
- Piping and The Oil Fields
- Produced / drained Water Treatment & disposal