

# Treatments for Crude Oil

## New Techniques in the Oil & Gas Industry

### Introduction

Hydrocarbon oil, water, gas, and even sand or solid material with dissolved minerals—typically a significant quantity of salt and other gases like hydrogen sulphide (H<sub>2</sub>S)—as well as solids, such as sand from the reservoir, dirt, scale, and corrosion products from the tubing—are typically produced by oil wells.

Before the oil and gas are sold, foreign materials like water and sand must be removed from them. We call this procedure "crude oil treating."

To prepare the liquid hydrocarbons (crude oil) for sale and shipment to refiners, these different components must be separated, eliminated, or transformed.

Starting with a brief overview of 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, this Course N Carry training course will give a broad overview of all the theories and technologies involved in crude oil treatment.

The produced water needs to be treated as well because of environmental laws. A summary of the procedures and operational settings required to meet the necessary standards for the produced water will be covered in the course.

Participants will have comprehensive knowledge and comprehension of crude oil treatment from A to Z (formation to refiner loading) with a particular emphasis on Oil Treatment Operation upon successful completion of this Course N Carry training course.

### Objectives

After completing this Course N Carry training course, learners will understand and have used the following in real-world situations:

- Understand the theory behind the formation, accumulation, and production of crude oil.
- Recognise the components and characteristics of crude oil.
- Fundamental knowledge of field treatment facilities in practice

- The characteristics and actions of crude oil that control its production and processing
- Learn how to treat and condition a full well stream for sales or final disposal in the field. This includes techniques for separation, dehydration, desalting, stabilisation, storage, and loading.
- Obtaining a thorough understanding of the functions and internal mechanisms of all surface facilities and treatment machinery

## Training Methodology

- Along with group activities, this training program consists of interactive sessions with questions, discussions, and problem solving under supervision.
- The program will be delivered as an interactive workshop that invites participants to apply the program's content to actual circumstances and share their own experiences.
- A variety of learning methods, such as group projects, case studies, simulations, open discussions, training films, and lecture style presentations, will support this training course.

## Organizational impacts

- It's common knowledge that an organization's growth is influenced by the competency of its workforce.
- Fantastic chance to increase the taught employees' knowledge base, which will improve their performance. Workers acquire new abilities, which they typically apply right away to their jobs.
- Employee retention is higher at a company if workers believe that they are learning and developing in their role (greater stability).
- It draws in potential workers by making a company or organization appealing.

## Personal Impact

- The worker will be qualified to perform operational duties with surface facility equipment.
- Skilled workers will save time and effort by acting more effectively when needed to address operational issues.
- Employee satisfaction increased as a result of their increased understanding of their jobs.
- Employees should improve their work skills if they have any flaws.
- Employees should perform better thanks to training.

## Who should attend?

A wide range of professionals can benefit from this Course N Carry training course, but the following are particularly noteworthy:

- Supervisors, senior operators, and field service/production operators
- Foremen of operations and team leaders
- Engineers in Plants, Fields, and New Technologies
- Coordinators and Planners for Maintenance
- Everyone involved in field maintenance (many trades) who wants to know what they maintain

# Course Outline

## Day 1

### From Formation to Production of Petroleum Crude

- The Production and Build-Up of Petroleum Crude
- Petroleum Reservoir Types
- Opening the Oil Well Drilling
- Creating the Oil Well
- Petroleum Crude's composition and characteristics
- Equipment for Field Service

## Day 2

### Process of Phase Separation

- Dual-Phase Gas-Oil Distillation
- Techniques for Digestion
- Gas-Oil Separation Tools
- Triple-Phase Gas, Water, and Oil Separation
- Three-Phase Horizontal Separators
- Three-Phase Vertical Separators
- Theory of Separation

## Day 3

### Treatment of Emulsions and Dehydration

- Emulsions of Oil
- Procedures for Dehydration and Treating
- Warming
- Chemical Procedure
- Electrical Assistance
- Emulsion theatres, or chemo-electric dehydrators

## Day 4

## **Crude Oil Desalting Process**

- An Overview of the Desalting Procedure
- Relationship between Remaining Water Volume, Salinity, and Salt Content
- Desalting by Electrostatic
- Calculating the Water Dilution Requirement
- Operational Parameter Impact
- Troubleshooting the Desalter System

## **Day 5**

### **Stabilisation, Sweetening, and Storage of Crude Oil**

- Operations for Stabilisation
- Stabiliser Types Using Energy as an Agent for Stripping
- Sweetening using Crude Oil
- An Overview of Storage Tanks for Crude Oil
- Units for Recovering Vapour
- Piping and the Fields of Oil
- Produced/Drained Water: Handling and Elimination