DEFINE™
MANAGEMENT CONSULTANCY & TRAINING

Training Title

PILOT PLANT OPERATIONS FOR REFINING PROCESSES & PROCESS TROUBLESHOOTING

Training Duration

5 days

Training Venue and Dates

REF PE147	Pilot Plant Operations For Refining Processes & Process Troubleshooting	5	23-27 March, 2020	$5,750	Amsterdam, Netherlands

In any of the 5 star hotels. The exact venue will be informed once finalized.

Training Fees

- **5,750 US$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch**

TRAINING DESCRIPTION

The Refinery is the engine of the oil industry where Crude is converted into fuels and lubes available for consumption by its customers. This needs to be done safely and efficiently. Pilot plant operation helps clients improve petroleum refinery production, quality and efficiencies. Capabilities range from crude oil introduction by desalting and distillation through resid upgrading applications. The refining pilot plants evaluate process and catalyst upgrades, troubleshoot refining operations, optimize production facilities, and prove the design basis for commercial applications.

This course gives an overview of the elements of the refining process and provides an insight into the criteria used to size and rate the individual components. Starting with the feedstock, the participant is gradually introduced to the various processes used to convert the crude into finished products. Troubleshooting of the processes and components is then introduced to allow the participant to analyze a system and restore it to a safe and operable state.

TRAINING OBJECTIVES:

By the end of the training course, participants will be able to:

- **A comprehensive overview of the Refining process from crude sourcing and analysis to product specifications and applications.**
- **Knowledge of fractionation of heavy and light hydrocarbon systems.**
- **Knowledge of hydroprocessing catalytic systems.**
- **Knowledge of conversion and octane processes.**
- **An understanding of the processes, equipment and procedures of the design, operation and control of Refineries.**

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- **In addition the unit operations of mass, heat and momentum transfer as applicable to refining are also developed including selection and sizing of heat exchangers, pumps, compressors, piping and control valve.**
- **Finally a systematic approach to troubleshooting of refining processes is developed including a section on root cause analysis.**

WHO SHOULD ATTEND

This course is a comprehensive core skills course for professionals dealing with all aspects of the Refining Industry. The course will be highly valuable to all engineers involved in the operation, design and troubleshooting of all refining facilities. Additionally, the course will be useful to any technical personnel wishing to gain a perspective of how Refining fits into the operation of an integrated oil company. Those who are experienced in other fields and seek a review of the fundamentals of refining will also find this course most beneficial.

TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. All presentations are made in excellent colorful power point. Very useful Course Materials will be given.

- **30% Lectures**
- **30% Workshops and work presentation**
- **20% Group Work& Practical Exercises**
- **20% Videos& General Discussions**

COURSE OUTLINE :-

- **Crude Oil Origin and Characterization**
- **Product Specifications and Applications**
- **Fractionation of Heavy and Light Hydrocarbons**
- **Hydroprocessing of Hydrocarbon Streams**
- **Octane and Conversion Process**
- **Process Control**
- **Troubleshooting Refining Processes**
- **Q&A Sessions**

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DAILY OUTLINE IN DETAIL

Following topics will be covered in 3 days

DAY-1

- **Course Introduction & Pre-assessment**

- **Crude Oil Introduction**
  - **Origin, production and transport of crude oil**
- **Crude Oil and Product Types**
  - **Classification of crudes**
  - **Product specifications of crude oil cuts**
  - **End Users specifications for gasoline, diesel, jet fuel**
  - **On line blending of products**
- **General Refinery Processes**
  - **Refinery overview and organization**
  - **Hydroskimming refinery, complex refinery, petrochemical refinery**
  - **Petroleum chemistry**
  - **Distillation basics**
  - **Trays, multidowncomer trays, structured packing**
- **Conversion Processes**
  - **Fixed bed hydrocracking**
  - **Ebullating bed hydrocracking**
  - **Visbreaking**
  - **Thermal cracking**
  - **Delayed coking**
  - **Fluid coking**
  - **Fluid catalytic cracking**

- **Q&A Session, exercises**

DAY-2

- **Octane Processes**
  - **Alkylation (HF alkylation, sulfuric acid alkylation)**
  - **Reforming (CCR reformer, catalyst regeneration, benzene precursors)**
  - **Isomerization (including de-isopentanizer and de-isohexanizer)**
  - **MTBE/ETBE**
- **Hydrotreating Processes**
  - **Steam reformer (hydrogen plant)**
  - **Chemistry of hydrotreating**
  - **Catalysts**
  - **Product yields and properties**

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  - Operating conditions and process variables
  - Desulfurization, aromatic saturation
  - Mild hydrocracking
  - Upgrading of aromatic gasoil and kerosene
- Sulfur Recovery
  - Amine wash
  - Amine regeneration
  - Claus process

- Q&A Session, exercises

DAY-3

- Unit Operations
  - Heat exchangers
  - Pumps
  - Compressors
  - Control valves
  - Drums

- Troubleshooting
  - Root cause analysis
  - Troubleshooting aids
  - Distillation
  - Fouling / coking
  - Pump failures
  - Incident causation
  - Control systems

- Case studies

- Q&A Session

DAY-4

- Process Control
  - Instrumentation
  - Regulatory control
  - Constraint control

- Optimization

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- **Refinery Material Balance**
- **Hydrogen Consumption**
- **Reaction Kinetics**

- **Process Emergency and Safe Guarding in Pilot Plant**

- **Course Closing and Final Assessment**

NOTE:
Pre & Post Tests will be conducted
Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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