Training Title

ATMOSPHERIC RESIDUE DE-SULFURIZATION TECHNOLOGY

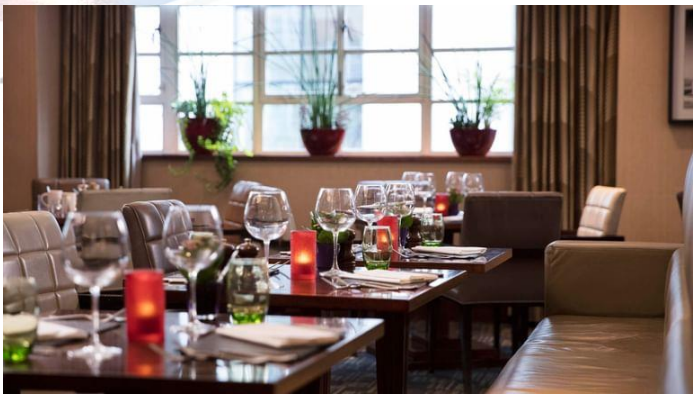
Training Duration

5 days

Training Venue and Dates

PE179	Atmospheric Residue De-Sulfurization Technology	5	12-16 February, 2024	$6,500	London, UK

Venue:In the 5-star hotel: Thistle Marble Arch Hotel, London,UK.



P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

Training Fees

$6,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments, and buffet Lunch.

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

The atmospheric residue desulfurization (ARDS) process is extensively used in upgrading heavy petroleum oils and residues to more valuable clean environmentally friendly transportation fuels and to partially convert the residues to produce low-sulfur fuel oil and hydrotreated feedstocks. Graded catalyst systems in multiple reactors are used in the process to achieve hydrodesulfurization (HDS), hydrodemetallization (HDM), hydro-denitrogenating (HDN), and conversion of residues to distillates at desired levels.

This course is designed to provide an in-depth practical review of the core elements of (ARDS) process technology including the key variables that affect product yields, properties, catalyst issues, reaction mechanisms, process design, operation, control, and optimization. A framework is presented for troubleshooting operating problems and, throughout this discussion, participants are encouraged to describe their specific challenges.

The course includes practical work examples and case studies to reinforce the key learning.

TRAINING OBJECTIVES

Upon completion of this course, participants will have gained a solid understanding of the key elements associated with the design, operation, monitoring, and troubleshooting of ARDS units. This will include the impact of feed quality, catalyst, operating conditions, and unit design on product qualities. In addition, they will have gained some valuable insight into how to optimize, debottleneck, and troubleshoot their ARDS units efficiently.

- Overview of the Catalytic Processes in a Refinery, with a special emphasis on ARDS units.
- ARDS Catalyst Evaluation Techniques.
- An understanding of Reactor and Catalyst interaction.
- The operation, control, and troubleshooting of a reactor and associated heaters, heat exchangers, and distillation equipment.
- An overview of reactors, practical solutions as well as theory.
- An understanding of essential reaction concepts.
- Valuable practical insights for trouble-free design and field-proven techniques for commissioning, starting, and shutdown of the reactor, heater, heat exchanger, and distillation operations of the ARDS units.
- To tailor your approach to specific design, analysis, and troubleshooting problems.

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

WHO SHOULD ATTEND?

This is a comprehensive core skills course for professionals dealing with all aspects of the Hydrotreating units. The course will be highly valuable to all engineers involved in the operation and design of Hydrotreating facilities. Additionally, the course will be useful to any technical personnel wishing to gain a perspective on how desulfurization fits into the operation of a complete refining plant. Those who are experienced in other fields and seek a review of the fundamentals of desulfurization technology 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 motivating everybody to find the right answers. You will also be encouraged to raise your questions and to share in the development of the right answers using your analysis and experiences. Tests of the multiple-choice type will be made available daily to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

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

DAILY OUTLINE

DAY 1

Course Introduction and Pre-Test

Introduction to Hydro-treating

- Refinery Overview
- HDT role in a refinery: the aim of the various treatments with hydrogen and integration in the refining scheme.
- Impurities in petroleum cuts and products, their impact on health, environment, and other refining processes
- Recent regulations and future trends: quality specifications of petroleum products and fuels
- Commercial history

ARDS Process Fundamentals

- Process description
- Chemical reactions
  - Characteristics of the chemical reactions
  - Thermodynamic and kinetic aspects
  - Consequences on the operation of units
  - Side reactions and optimum operating conditions to deplete their evolution.

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

- Specific features of reversion reactions

Case Study

Q&A Session for Day 1 Topics

DAY 2

ARDS Unit Process Design

- Design considerations
- Feed and product quality
- Flow schemes
- Typical processing conditions
- Reactor systems (H Oil/UFR/OCR difference and significance)
- Steam Strippers
- Steam Generators
- Amine absorption system
- PSA System
- Fired Heater
- Fundamentals of Fractionator
- Corrosion Control in Fractionator
- Complex control system (Reactor/Heater/Recycle gas/PSA/Feed system)

Case Study

Q&A Session for Day 2 Topics

DAY 3

ARDS Unit Operation, Monitoring and Troubleshooting

- Operating conditions and compositions of the main streams; mass balance and yields, sulfur balance, hydrogen balance, and consumption
- Significance of the operating variables and their influence on the process: mean temperatures and profile, pressures, partial pressure of hydrogen, recycle rate, quench ratio, feed flow rate, and space velocity.
- Advanced process control and optimization of the process
- Catalyst follow-up and cycle length optimization, aging, and deactivation.
- Reaction selectivity and activity
- Maximizing the performances of the unit under constraints or limited conditions

Process Capabilities

- Feedstocks and applications
- Hydrogen utilization
- Product qualities
- Catalyst consumption
- Hydrogen consumption
- Utilities

Case Study

Q&A Session for Day 3 Topics

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

DAY 4

Catalysis

- Nature of ARDS Catalysts
- Composition and activity
- Catalyst selection and reactor loading diagrams.
- Multi-catalyst Systems
- Hydrogenation – Dehydrogenation Equilibrium
- Sulfating procedures: role, steps, and details of the different methods
- Catalyst poisons
- Catalyst deactivation

Catalyst Management

- Reactor loading and unloading, catalyst handling.
- Reactor distribution and internals
- Effects of poor distribution
- Developments in internal design
- Pressure drop management.
- Commercial Catalysts

Case Study

Q&A Session for Day 5 Topics

DAY 5

Start-up, Shutdown, and Troubleshooting

- Startup/Shutdown/Emergency handling procedures
- Causes of quality decrease and corresponding actions
- Main automatic safety systems
- Feed pump failure, heater failure
- Compressor failure: fresh gas or recycling, adapted reaction, and safe shutdown.

Case Study

Q&A Session for Day 5 Topics

Course Closing and Final Test

NOTE:

Pre & Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day Reviews, and assessments will be carried out.

……

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com