

Heavy Cuts Processing

5 days
Overview

REF2-EN-P

LEVEL

Knowledge

PURPOSE

This course provides a comprehensive knowledge of refining processes available to upgrade heavy cuts into lighter ones.

LEARNING OBJECTIVES

Upon completion of the course, the participants will be able to:
understand differences between refining conversion processes with regard to planning, operations and investment issues,
analyze the operating parameters of these conversion processes,
acquire the basics for operating cracking units,
know about on the latest developments in heavy cuts processing.

WAYS AND MEANS

Case studies based on real industrial situations.

LEARNING ASSESSMENT

Quiz.

PREREQUISITES

To fulfill at least one of the following criteria:
to have a 3 months proven professional experience in the refining or petrochemical industry,
or to have followed a training course orientated to introduction to the refining environment.

Agenda

OVERVIEW OF CONVERSION PROCESSES

0.25 d

Origins and characteristics of conversion unit feeds.
Different types of conversion processes (principles, performance, operating ranges, economics): thermal cracking processes, catalytic cracking without hydrogen, catalytic cracking with hydrogen.

THERMAL CONVERSION PROCESSES

1.5 d

Visbreaking and effects on quantity and stability of heavy fuel oils.
Delayed coking: process characteristics, process flow diagram, purification of the cracked products with hydrogen and end destination.
Management of coke drum switch and main steps of the decoking procedure, coke handling.
Flexicoking and fluid coker: principle, integration in the refinery and power.

CATALYTIC CRACKING

1.25 d

Main fluid catalytic cracking processes.
Catcracking feed characteristics.

Mechanisms of catalytic cracking reactions and mode of action of FCC catalysts.
Yields and characteristics of FCC effluents with overview of purification treatments: propylene recovery, alkylation, ETBE and gasoline pool, LCO hydrotreatment.
Analysis of FCC operating balances.
Summary of operating parameters in the reaction section and in the regenerator.
FCC alternates to treat residues (R2R, HOC, etc.).
Maximization of C₃ and C₄ olefins, gasoline or cracked gasoil (LCO) production.
Presentation of different process schemes.

DISTILLATE HYDROCRACKING

1.25 d

Different reactions of the hydrocracking process.
Catalysts: hydrotreating and hydrocracking; poisons and regeneration.
Hydrocracking processes: different types, process flow diagram, operating conditions.
Analysis of hydrocracking operating: parameters, hydrogen balance, sulfur balance.
Associated unit: hydrogen production, sulfur recovery.
Product yields and quality utilizations.

RESIDUE PROCESSING

0.5 d

Overview of existing processes to upgrade vacuum residues: hydrotreatment, hydroconversion.
Associated units.
Refinery configurations with deasphalting unit.

LUBE BASE STOCKS MANUFACTURE

0.25 d

Classification and required properties of base oils.
Main lube base stocks manufacturing schemes: vacuum distillation unit, deasphalting, extraction, dewaxing, hydrofinishing.