

Planning & Economics of Refinery Operations

3 days

EAV/PERO

Overview

LEVEL

Skilled

PURPOSE

This course provides a better understanding of the essential elements of refinery operations in order to review the various parameters which affect refinery profitability and to develop a working knowledge of the management tools used in the refining industry.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:
assess the latest trends in product specifications, and refining schemes,
calculate product value, refinery margins and process unit margins,
simulate and to optimize refinery operations, crude oil selection and product manufacturing,
analyze the results of a linear programming model optimization.

WAYS AND MEANS

Case studies and exercises derived from present refinery situations.
Economic optimization using Excel.
Quiz.

LEARNING ASSESSMENT

Participants will be evaluated during the training through exercises and case studies.

PREREQUISITES

Basic notions of Microsoft Excel.

Agenda

TECHNICAL OVERVIEW

Brief technical presentation of the main refining units: distillation, conversion, etc.
Refinery scheme evolution.

0.25 d

REFINERY MARGINS & COSTS

Refinery margins and costs: definitions and evolution worldwide.
Notion of break-even point.
Unit margins and intermediate product valuation.
Case studies: crude oil arbitrage, Fluid Catalytic Cracking (FCC) unit margin.

0.75 d

REFINERY BLENDING SIMULATION

Case study: managing the blending operation of a refinery taking into account the economic and technical (product specifications, capacities, etc.) constraints.

0.5 d

OPTIMIZATION OF REFINING OPERATIONS - LINEAR PROGRAMMING

1 d

Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.

Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.

Case study on Excel: explanation of a refinery model matrix (material balances, product specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery and on the result analysis.

CRUDE OIL ASSESSMENT & SELECTION

0.5 d

Different methods to assess a crude: netback value, method of the complementary crude.

Case study: crude oil ranking using a LP model.