

This course can be adapted to virtual classroom mode

Petroleum Products - Properties & Manufacturing Schemes

5 days

PPE-EN-A

Overview

LEVEL

Skilled

PURPOSE

This course provides a deeper knowledge of petroleum products' properties and specifications. For each product, the manufacturing scheme is explained in details.

LEARNING OBJECTIVES

Upon completion of the course, the participants will be able to:

- list the components of each petroleum product,
- grasp the main characteristics of petroleum products and their relevance for end-users,
- identify recent changes and future trends for the petroleum products' specifications,
- describe and explain the manufacturing scheme for each product.

WAYS AND MEANS

Use of interactive educational games to facilitate the understanding of the manufacturing schemes.

LEARNING ASSESSMENT

Multiple-choice questionnaire.

PREREQUISITES

In order to be able to follow this training, trainees are asked to fulfill at least one of the criteria below:

- either a proven experience in the use or constitution of petroleum products of at least 1 year,
- or to be in evolution towards a position related to petroleum products,
- or to have previously followed a training type "Refining Processes & Petroleum Products".

Agenda

ORIGIN & COMPOSITION OF PETROLEUM PRODUCTS

0.5 d

Composition and main characteristics of crude oils.

Principle of oil refining processes: Fractionation of crude oils in cuts, modification of the chemical composition of the cuts to produce the bases suitable for the fuel manufacturing. In-line blending to produce the commercial products.

Specifications based on normalized tests, tests significance, accuracy of the methods (repeatability and reproductibility).

PROPERTIES & FORMULATION OF ENERGY PRODUCTS

3.5 d

For each major product (LPG, automotive gasoline, jet fuel, automotive diesel oil, heating oil and heavy fuel oils), the following aspects are developed:

Market trends - Volatility characteristics - Combustion properties - Air pollution: engine emission specifications - Storage stability - Manufacturing schemes - Main additives incorporated in the refinery.

Manufacturing: in line blending, on line analyzers. Tank Quality Integration (TQI). Analyzer certification advantages.

In addition, in view of current trends, emphasis is placed on the following issues:

Automotive gasoline: aromatic content limitation, addition of biofuels (ethanol and ethers) and specific case of BOB (Blendstock for Oxygenate Blending): impact on the refining scheme. Impact of the formulation on the engine emissions. Performance additives added at the terminal.

Jet A1: market trend, agro-fuels incorporation.

Automotive Diesel oil: problems raised by the high A.D.O demand in Europe; consequences of the more stringent limitation of the engine emissions for the car makers (new post-treatment systems); potential quality problems related to the presence of agro-fuels (FAME – Fatty Acid Methyl Ester, HVO - Hydrotreated Vegetable Oil); performance additives added at the terminal.

Heating oil: problems related to the high cracked stocks content; differences of composition between ADO and HO.

Heavy fuel oils: stability of visbroken fuels. Modifications of the refining scheme related to the coming marine fuels standard (in 2020).

MAIN NON-ENERGY PRODUCTS

0.5 d

Bitumen:

The different types of bitumen: pure, polymer-modified, emulsions.

The major standard tests: penetration, softening point, ageing. Introduction to rheological measurements used by the road builders.

Lube base oils:

Base oils manufacturing from vacuum distillates. Composition/properties relationships for base oils.

Conventional and non-conventional lube chains.

Properties and characteristics of base oils: viscosity index, cold properties, oxidation stability...

Base oils groups.

WORLDWIDE MARKET - PRICE & COST MANAGEMENT

0.5 d

Oil price variation, refining margin, product prices.

Trading, pricing mechanism, marketing strategies.