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# Petroleum Refining & Petrochemicals for Non-Technical Personnel

## INTRODUCTION

- This Petroleum Refining & Petrochemicals for Non-Technical Personnel training seminar is designed for non-technical professionals who work within the Petroleum Refining & Petrochemicals industry, who would like an insight into chemical processes, plant operations, equipment and economics.
- This training seminar examines the intricacies of refining and petrochemicals, each of which will be broken down into core building blocks whose concepts will be explained. These will allow non-technical company personnel to interface seamlessly and effectively with their technical counterparts in their organization. Understanding of these key concepts enhances problem-solving and troubleshooting skills in specific job functions, as well as improve interdepartmental communication.
- This Petroleum Refining & Petrochemicals for Non-Technical Personnel training seminar examines the history and use of petroleum from exploration through to refining and then to petrochemicals. The technology used and the production operations of the oil industry are outlined and explained in a clear easy to understand language.
- Designed for non-technical professionals who function within the Petroleum Refining & Petrochemicals industry, this training seminar promises an insight into chemical processes, plant operations, equipment and economics.

### This training seminar will include:

- Fundamental technical skills to comprehend what oil & gas is, how it was formed and discovered and the various methods for getting it to the marketplace
- The significance of how reserves are estimated and the importance of how long this resource will last
- Awareness of the surface facilities for the treatment of well fluids and their subsequent refining into fuels and petrochemicals
- Understanding of the separate processing requirements for producing a marketable on-specification product and recognize the importance of crude oil type and refinery complexity have on profitability
- Understanding how blending operations are a refiners last chance to improve his bottom line
- Appreciation of the importance of crude oil and natural gas transportation logistics on the oil and gas value chain
- Improving the gas value chain through the commoditization of natural gas into petrochemicals, natural gas in some cases is either flared or re-injected into crude oil wells

## OBJECTIVES

By the end of this training seminar, participants will:

- Comprehend the basic differences between exploration, and refining and petrochemicals
- Understand the basics of the various refining and petrochemical processes
- Examine the fundamental differences in various refinery types, their complexity and impact on their profitability
- Identify the basics of the different building blocks of petrochemicals
- Appreciate that aromatic based petrochemicals are important to the polymer industry even though the refining industry is trying to minimize these in gasoline due to its toxic properties
- Appreciate that olefinic and aromatic petrochemical precursors are specialty chemicals produced by the refining processes from refineries of high complexity numbers

## TRAINING METHODOLOGY

This training seminar will utilize a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented, including:

- Lectures
- The Use of PowerPoint presentations
- Short videos to reinforce specific points and relate the material to the real world
- Case studies and exercises that will be augment the seminar
- Discussions in a highly interactive programme that will offer and encourage the participants to advance their opinions and ideas

## ORGANISATIONAL IMPACT

- Recognized and respected certification for the delegates attending
- Assurance that the seminar is delivered by a quality training organization using a very experienced instructor
- Field engineers and staff with a deeper understanding and a better capability to critically analyze the methodologies employed within the industry
- Managers who have a broader overview and understanding of the structure and operations of the oil and gas production
- Comprehend that countries with abundant gas reserves that are utilized for petrochemical production have a competitive edge against their naphtha based competitors particularly during high crude oil prices (above \$70/bbls)

## PERSONAL IMPACT

- Develop an appreciation and understanding of the origins of oil and gas
- A deeper insight of oil chemistry
- Appreciate that natural gas utilized for petrochemical production has a competitive edge against naphtha based petrochemicals at times of high crude oil prices
- Recognition of the different types of feedstock and their origins
- Enhance the participant's awareness about influential parameters in an oil and gas field development plan
- A basic understanding of the principles of the mechanics of petrochemical production distribution, marketing and uses

## WHO SHOULD ATTEND?

- This Petroleum Refining & Petrochemicals for Non-Technical Personnel training seminar is specifically designed to be of substantial benefit to non-technical personnel within the Oil and Gas Industries. This training seminar is also suitable to a wide range of professionals but will greatly benefit:
- Non-technical professionals assigned to positions in refineries and petrochemical plants, corporate offices, suppliers and other interrelated companies
- Support Personnel including Environmental professionals, Accountants, Business managers, Administrative and legal staff, Sales and marketing personnel, Insurance representatives, Personnel managers, Financial professionals and other professionals who desire a better understanding of subject matter
- Newly-hired refinery or petrochemical plant personnel and current semi-technical personnel who require further training
- Other support staff who have an interest in increasing their understanding of Petroleum Refining & Petrochemicals production and operations
- Business Development Managers, Corporate Planning professionals and business analysts switching disciplines who are required to have a better understanding of this stimulating field
- Energy industry journalists and reporters
- Professional personnel such as legal, banking, insurance, finance dealing with oil supply, Petrochemicals, refining and transportation

## Course Outline

### Origin and Nature of Petroleum

- Chemistry of Fossil Fuels
- Basic Petroleum Geology
- Origins, Formation and Trapping of Oil & Gas
- Exploration and Production Methods
- Transportation Logistics

## Overview of Refining

- Classification of Hydrocarbons
- Surface Processing of Oil and Gas
- Refinery Types and Complexity
- Hydroskimming, Cracking and Coking Refineries
- Refining Margins and Profitability
- Seminar Exercise - Netback & Complexity Factors

## Refinery Process Operations

- Physical Separation – Crude and Vacuum Distillation
- Chemical Conversion Processes, Gasoline Production
- Hydrotreating, Catalytic Reforming, Alkylation, and Isomerization
- Residue Reduction I: Cat Cracking, Hydrocracking, Visbreaking, Hydrocracking
- Residue Reduction II: Coking, Asphalt and Residual Fuel
- Seminar Exercise - Blending

## Petrochemicals I - Production and Uses

- Production and Segregation of Olefinic and Aromatic Compounds
- Olefin based Compounds
- Ethylene
- Propylene
- Butadiene
- Isobutylene
- Aromatic based Compounds
- Benzene
- Toluene
- Xylene

## Petrochemicals II - Production and Uses

- Commoditization of Natural Gas
- Natural Gas based Compounds
- Ammonia
- Methanol
- Gas to Liquid Technologies
- Case Study - Petrochemical Production – Major Companies
- Seminar Roundup and Discussions

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