



Introduction to Petroleum Refining Processing

Potential PDH: 20

Description:

This seminar program, outlined below, was designed to serve as an introduction to petroleum refining processing. The seminar focuses on the core refining processes of fluid catalytic cracking, alkylation, hydrotreating, hydrocracking, and catalytic reforming, although all major processes are covered in detail. The speakers will discuss feedstock properties, process chemistry, process variables, operating conditions, unit configuration, and refinery products. The interaction between yields, operating variables, and product variables will also be covered. In addition, the basic economics associated with petroleum refining and the impact of recent environmental regulations will be discussed. These program sessions will be presented by petroleum industry professionals who have extensive experience in all of the major processing areas in petroleum refining.

Outline:

1. How does a refinery fit into our overall business?
2. Our business is:
 - Finding crude and gas
 - Transporting crude to the refinery
 - Converting crude into valuable products (REFINING!)
 - Moving and marketing the products
3. This module will introduce you to:
 - How a Refinery converts crude (and other feedstocks) into products
 - What goes into the Refinery (crude and other feedstocks)
 - What comes out of the Refinery (products)
4. Reminder of Potential Refinery Hazards
5. The Refining Process
 - Understanding Crude
 - Refinery Products and Specifications
6. Types of Refineries
 - The Four Basic Refining Processes
 - Typical Refining Units
 - Balancing the Refinery
 - Product Realization of Refinery Types
7. Crude Oil Distillation Fundamentals
8. Hydrotreating of Petroleum
 - Hydrotreating Catalysts

- Chemistry and Process Flow
- Process Variables and Operating Conditions
- Hydrotreated Product Yields and Properties

9. Hydrocracking of Petroleum

- Hydrocracking Catalysts, Chemistry & Process Flow
- Process Variables and Operating Conditions
- Hydrocracker Yields and Product Properties

10. Isomerization

- Catalysts, Chemistry & Operating Conditions
- Process Flow/Processing Options
- Isomerization Yields and Product Properties

11. Catalytic Reforming

- Reforming Catalysts
- Chemistry and Process Flow
- Process Variables and Operating Conditions
- Reformer Unit Configuration
- Reduction of Aromatics and Benzene in Reformate

12. Fluid Catalytic Cracking

- Mass, Heat, and Pressure Balance
- FCC Catalysts, Chemistry & Process Flow
- FCC Process Variables/Operating Conditions
- Cracking of Heavy Feedstocks

13. Alkylation

- HF Alkylation Process
- Sulfuric Acid Alkylation Process
- Feedstock and Product Properties

14. Heavy Oil Processes

- Delayed Coking
- Visbreaking
- Solvent Deasphalting



Who Should Attend:

The program has been designed for personnel recently assigned to positions in the petroleum refining industry or for operations personnel with substantial hands-on experience. It is assumed that those in attendance have backgrounds in engineering and chemistry or have actual refinery operating experience. Interested parties who do not have technical or refinery backgrounds should consider attending our alternate program, "Basics of Petroleum Refining for Non-Technical Personnel."

Subject Matter Expert (SME):

BECHT LEARNING AND DEVELOPMENT

Course Content



Page 3 of 3

Michael (Mike)Bober holds a BS in Chemical Engineering from the New Jersey Institute of Technology. He served as a Process Engineer, Project Developer, Economist, and Manager at Exxon's Bayway Refinery for twelve years. He then joined Mobil Research and Development as an FCC Specialist. He managed technical training for Engineering, worldwide, until Exxon and Mobil merged in 2000. At this point, he managed worldwide technical training for ExxonMobil Research and Engineering and then retired from managing the Technical Portfolio for ExxonMobil's Global Manufacturing Training initiative – with a combined service of 37 years to the two companies.