€TRAINING

Petroleum Refining-Production Planning, Scheduling and Yield Optimization

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Introduction:

This program is specifically designed to identify and resolve issues of production planning and scheduling in petroleum refineries that are most commonly encountered by refinery personnel working in this area. Issues of operations scheduling for petroleum refining are discussed in depth. It will also be enhanced with planning and scheduling examples and will provide relevant background information on the subject.

Additionally, the program will present a detailed overview of refining process yields, from the crude oil feed to the finished products. Major refining processes are presented and discussed, including feedstock, feedstock preparation, operating conditions, catalysts, yields, product properties, and economics.

The program is oriented toward the practical aspects of refinery operations as well as the terminology and economics of refining.

Course Objectives:

At the end of this course the participants will be able to:

- Gain an appreciation of production planning and scheduling tools that will be useful for planning of crude and product deliveries
- Discover and appreciate the similarities and differences between planning and scheduling
- Understand the principles of scheduling optimization and promote efficient refining operations, and yield optimization
- Learn the skills to crude selection and optimization that results in improved profitability
- Develop the skills necessary to apply blending techniques using excel
- Learn how to familiarize and understand the various refinery types and appreciate how refining complexity impacts refining optimization and refining margins
- Comprehend the importance of quality giveaways and learn how to use practical excel spreadsheets for blending calculations to reduce quality giveaways
- Use hands-on software that allows professionals in the industry to choose different crude diets to optimize refinery utilization efficiency and profitability
- Act as a primer into the industry of Petroleum Refining and familiarize industry professionals with all processes associated with the processing of petroleum into finished products
- Equip new engineers into the industry, with the basic tools for understanding the complex nature of Refining and its operations

Targeted Audience:

- Refining professionals working in the industry either as refining technologists or in refining operations and engineers
- All professionals involved in Production, Planning, and Scheduling
- Process engineers and technologists engaged in planning and scheduling activities and who are required to understand and discuss issues related to their industry
- Operations personnel including shift supervisors
- Marketers and refinery planners
- Blending professionals
- Refining Technologists
- Other engineers who would like a further understanding of the complex refining processes
- Accountants, marketers, and other professions who would like to understand the complexities and terminology of Production Planning & Scheduling in Petroleum Refineries
- Persons who wish to update themselves on the methods used in this important field and learn how to implement error-free methods for the benefit of their organizations

Course Outlines:

Unit 1: Application of Planning and Scheduling:

- Refinery Configuration:
- Hydro skimming Refinery
- Refineries with Secondary Conversion Process
- Integrated Refineries
- Existing & New Refineries
- Choice of Crude
- Crude oil scheduling
- Choice of Processes
- Capacity utilization of Crudes
- The severity of Process Operations
- Cut-points Optimization
- Facing Upset Situations
- Tankage Requirement

Unit 2: Improving Product Movements and Releasing Tankages:

- Basic Information Required
- Crude Assay
- Intermediate Feed Characteristics
- Yields and Properties
- Different Process Units
- Utilities

Unit 3: Product Blending Rules:

- Product Specifications
- New Trends in fuel production
- Environmental Issues

- Crude Cost
- Product Netback

Unit 4: Formulation of Problem:

- Refinery Flow-sheets
- Simplified Material Balance
- General Formulation
- Demand Equations
- Product Inventory Control
- Product Quality Control
- Fixed Composition Blend
- Capacity Control/ Constraints
- Availability of Feedstock/ Control

Unit 5: Application to a Refinery Worksheet:

- Petroleum Product Movement and Product Exchange
- Marginal Depot Supply and movements
- Commonly Used Methods & Recent Developments
- Mathematical Approach to Solution
- Linear Programming
- Graphic Method
- Vendors Software

Unit 6: Crude Oil Yields Refinery Technology:

- Crude Oil Origins & Characteristics
- Crude oil Assay and properties
- Crude oil products
- Product specifications
- Gasoline
- Kerosene/ Jet Fuel
- Fuel Oil/ Diesel Fuels
- Petrochemical Feedstocks
- Refineries Complexity
- Overall refinery flow: Interrelationship of processes

Unit 7: Petroleum Refinery Processes:

- Crude Processing
- Desalting
- Atmospheric distillation
- Vacuum distillation
- Heavy Oils Processing - Cocking and Thermal Processes
- Delayed Coking
- Fluid Coking
- Flexicoking
- Visbreaking

Unit 8: Process for Motor Fuel Production:

- Fluid catalytic cracking
- Hydrocracking
- Cat Cracking
- Isomerization
- Alkylation
- Hydrotreating
- Catalytic Reforming

Unit 9: Supporting Operations:

- Blending for Product Specifications
- Hydrogen production
- Refinery Gas Plants
- Acid Gas Treating
- Sulfur Recovery Plants

Unit 10: Refinery Economics:

- Residue Reduction
- Asphalt and Residual Fuel
- Cost Estimation
- Economic Evaluation