

# Advance Refinery Operations Plants Process and Troubleshooting

## Course Description

### INTRODUCTION

Refinery processes consist of many complex apparatuses involving both moving and static parts as well as interconnecting pipes, control mechanisms and electronics, mechanical and thermal stages, heat exchangers, waste and side product processing units, power ducts and many others. Bringing such a complicated unit online and ensuring its continued productivity requires substantial skill at anticipating, detecting, and solving acute problems. Failure to identify and resolve these problems quickly can lead to lost production, off-spec products, equipment loss, and even catastrophic accidents. Therefore, the ability to troubleshoot refinery operations is one of the most valuable skills operations personnel can possess.

### OBJECTIVES

- Apply and gain an in-depth knowledge on advanced refinery operations plants process and troubleshooting.
- Discuss petroleum refinery process including crude processing, desalting, atmospheric distillation, and vacuum distillation.
- Explain heavy oils processing and bottom of the barrel upgrading covering the coking and thermal processes, delayed coking, fluid coking, flexicoking and Visbreaking.
- Carry out process of production that covers the fluid catalytic cracking, hydrocracking, cat cracking, isomerization, alkylation, hydrotreating and catalytic reforming.

- Review process operations key operational conditions and factors as well as discuss blending for product specifications, hydrogen production, refinery gas plants and acid gas treating.
- Identify process troubleshooting including troubleshooting concepts and techniques, troubleshooting tools, typical problems, flooding, and its detection.
- Determine refinery economics comprising of residue reduction, asphalt and residual fuel, refinery complexity and netback.

### **WHO SHOULD ATTEND?**

- Production Engineers
- Operations Engineers
- Refinery Team Leaders
- Process Engineers
- Process Technical Staff
- Plant Supervisors, Lead Operators Control Room Operators & Shift Supervisors

### **Day 1**

- Petroleum Refinery Process
- Crude Processing
- Desalting
- Atmospheric Distillation
- Vacuum Distillation
- Heavy Oils Processing/Bottom of the Barrel Upgrading (Cocking & Thermal Processes, Delayed
- Process of Production
- Heavy Oils Processing/ Bottom of the Barrel Upgrading (Cocking & Thermal Processes, Delayed Coking, Fluid Coking, Flexicoking, Visbreaking)
- Process of Production

## Day 2

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

## Day 3

- Process Key Operational Conditions & Factors
- Blending for Product Specifications
- Hydrogen Production
- Refinery Gas Plants
- Acid Gas Treating
- Utilities
- Sulfur Recovery Plants

## Day 4

- Utilities
- Oil & Gas Measurement & Control
- Process Troubleshooting Concepts & Techniques
- Troubleshooting Tools
- Typical Problems
- Flooding & its Detection
- Interaction of Process & Equipment

## Day 5

- Saltation & Entrapment
  - Tower Scan & Inspection
  - Refinery Economics
  - Residue Reduction
  - Asphalt & Residual Fuel
  - Refinery Complexity & Netback
  - Economic Evaluation
  - Cost Estimation
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