



Crude Oil Distillation

Potential PDH: 24

Description:

Crude distillation is the first process in the refining sequence and is vital to the profitability of refinery operations. This importance has grown with the advent of cleaner fuels. This program has been developed to provide an in-depth yet practical review of the art and science of crude distillation. Consistently maintaining smooth operation, capacity and product quality are critically important goals that can be difficult to achieve. Many complex process, equipment, and reliability issues have to be balanced to optimize run-length, capacity, and quality. With the many variables involved, constant adjustments are required.

The program's content is both comprehensive and wide-ranging. Sessions begin with a discussion of fundamentals, including process objectives, crude oil characterization, products, process flow sequences, heat integration, desalting, and major equipment design. Attendees will gain an understanding of how process requirements, equipment operation, and economic objectives interact. Once the fundamentals are established, the session moves into the topics of operation, control, troubleshooting, and revamps. The program speaker is Mr. Andrew Sloley, a Principal Engineer at CH2M Hill in Bellingham, Washington.

Outline:

Introduction and Process Objectives

- Feed and Products
- Importance to Refinery Operations
- General Process Sequences
- Major Equipment
- Heat Integration

Crude Properties

- Crude Types
- Crude Oil Characterization
- Heavy Oil Fractions

Crude Unit Products

- Lights Ends
- Naphthas
- Kerosene and Jet Fuel
- Diesel
- Gas Oils



- Residues
- Process Flow Sequences
- Topping and Simple Units
 - Conventional Atmospheric-Vacuum
 - Preflash Columns and Drums
 - Gas Oil Columns
 - Vacuum Columns
 - Diesel Recovery Options
 - Naphtha-Kerosene Recovery Options
- Heat Integration and Exchangers
- Heat Exchanger Networks
 - Heat Train Limitations
 - Cold Versus Hot Train Duties
 - Split Trains
 - Pinch Analysis
 - Exchanger Design
 - Typical Operating Conditions and Performance
- Desalting
- Corrosion, Fouling, Contaminants
 - Single Versus Two-Stage
 - Operation
 - Salt Content and Removal Efficiency
- Fired Heaters
- Heater Types
 - Operating Limits
 - Heat Flux
 - Steam Injection
- Atmospheric Distillation
- Process
 - Equipment
 - Overhead Systems
 - Metallurgy
- Vacuum Distillation
- Process
 - Equipment
 - Vacuum Systems
 - Metallurgy
- Control, Monitoring, Troubleshooting
- Daily Monitoring
 - Control Options
 - Troubleshooting Common Problems





- Poor Separations
- Heat Removal and Heat Input
- Entrainment – Black Products
- Foaming
- Hydraulics

Revamps

- Revamp Strategies
- Defining Unit Performance
- Discovering Opportunities
- Future Directions: Energy Efficiency and Climate Change

Current Topics

- Light Crudes and Tight Oils
- Diesel Recovery
- Condensate Splitting

Who Should Attend:

Program participants will have ample opportunity to obtain a broad working knowledge of crude unit operations, to gain insight into current technology and trends, and to interact with others working in this area. The program is ideal for personnel involved in refinery process engineering, plant operations, troubleshooting, and technical services. Process engineers from design and construction companies as well as those providing services to the petroleum refining industry should also find this program beneficial.

Subject Matter Expert (SME):

Andrew W. Sloley is an independent consultant with over 40 years of experience in the hydrocarbon processing industry. He has worked extensively on petrochemical and refining units. His specialty in this area has been on product separation, distillation, and heat integration. This has covered the range from crude and heavy oils to cryogenic systems for light-ends recovery and gas treating. His other responsibilities have included technology analysis and economic evaluation. Andrew has authored or co-authored over 400 publications in these areas. He is currently a contributing editor on equipment and plant design for Chemical Processing magazine. He has a B.S. degree in Chemical Engineering from the University of Tulsa and is a licensed professional engineer in Texas. His experience in over 100 crude units has covered the entire range of crude blending, process configuration, optimization, equipment design, control, and troubleshooting issues for all types of crude units.