BECHT TECHNICAL TRAINING

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Course Content

Title: Introduction to Petroleum Refining + Aspen HYSYS 101

Potential PDH: 28   **Code:**   BTT059

Description:

Upon completion of this course, participants will be able to use fundamental knowledge on refining processing and the use of process simulations. They will:
- Develop a baseline understanding of refining business from feedstocks to products
- Develop a baseline understanding of key process technologies
- Leverage the intuitive solving capabilities and other key features of Aspe HYSYS and Aspen HYSYS Petroleum Refining
- Gain confidence in modeling distillation and fractionation columns
- Perform Case Studies to determine the optimum operating points for a process
- Learn the different options for defining and managing crude oil assay information and properties

Outline:

1. Introduction to Petroleum Refining

How does a refinery fit into our overall business?
Our business is:
- Finding crude and gas
- Transporting crude to the refinery
- Converting crude into valuable products (REFINING!)
- Moving and marketing the products

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)

Reminder of Potential Refinery Hazards
The Refining Process
- Understanding Crude
- Refinery Products and Specifications

Types of Refineries
- The Four Basic Refining Processes
- Typical Refining Units
- Balancing the Refinery
- Product Realization of Refinery Types

Overview of Key Refinery Processes
- Crude Oil Distillation
- Hydrotreating
- Hydrocracking
- Isomerization
- Catalytic Reforming
- Fluid Catalytic Cracking
- Alkylation

• Heavy Oil Processes

2. Aspen HYSYS 101

Aspen HYSYS Process Simulation Overview
- Identify the benefits of process simulation
- Describe the capabilities of Aspen HYSYS
- Introduce the Aspen HYSYS graphical user interface and organizational structure

Getting Started
- Enter necessary elements to fully define a fluid package
- Specify required parameters to execute flash calculations and fully define material streams
- Modify and set desired units of measure
- Add and connect unit operations to build a flowsheet
- Use available tools to manipulate the user interface
- Convert a simulation case to a template
- Workshop

Getting Started HYSYS Petroleum Refining
- Introduce Aspen HYSYS Petroleum Refining
- Outline the workflow for starting a HYSYS Petroleum Refining Simulation
- Discuss Petroleum Assay input options
- Use HYSYS Petroleum Refining assays within a process flowsheet
- Workshop

Pre-Heat Train
- Introduce the Aspen HYSYS Heat Exchanger unit operation
- Implement mathematical operations (Balance and Adjust)
- Use the Case Study feature to run flowsheet-wide scenarios
- Workshop

Atmospheric Crude Column
- Build and converge an atmospheric crude column
- Use Aspen HYSYS to analyse and predict the behavior of a simulated column
- Add side strippers and pump arounds to a column to improve operation and efficiency
- Use HYSYS Petroleum Refining petroleum properties to monitor column performance and product quality
- Use cut-point specifications to improve product quality and quantity
- Workshop

Vacuum Tower & Heat Integration
- Install a vacuum tower with side draws and pump arounds
- Perform packing sizing and rating calculations using the Column Analysis feature
- Review the Recycle logical operation
- Export column pump around streams to the main flowsheet and integrate them wit other unit operations
- Configure a Heat Exchanger model in Rating mode
- Workshop

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Course Content

Refinery Reactors
- Review refinery reactor capabilities in Hysys Petroleum Refining
- Introduce the workflow of various reactor models

Instructor:

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.

Purnima Kharidehal, Ph.D., a Principal Technical Consultant at Aspen Technology, has 7+ years' experience in process simulation modelling software. Dr. Kharidehal is a subject matter expert providing technical training and consultation in several specialized areas like Aspen HYSYS, Aspen EDR and other AspenTech Engineering products. Dr. Kharidehal has received her Ph.D. and master's in Chemical Engineering from Louisiana Tech University. She also worked as a Post-Doctoral Researcher at University of Houston where she applied computational catalysis techniques, to theoretically study catalytic process that enable the more efficient use of natural resources.