Catalytic Reforming Fixed Bed Simulation and Tutorial

A self-paced MultiMedia based Tutorial/CBT and real-time dynamic simulation of a Catalytic Reforming Unit - Fixed Bed.

**Tutorial/CBT:**

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for Fixed-Bed Semi-Regenerative Catalytic Reforming Unit using Voice, Video, Animation and Graphics.

**Overview**
- Introduction
- Importance of Reformer in Refineries
- Importance of Reformer in Petrochemical Plants
- Feedstock Types
- Process Overview
- Classifications of Reformer Units

**Reformer Components**
- Feed Preparation and Preheat System
- Reactor and Furnace System
- Reactor Effluent Cooling and Separation System
- Product Stabilization and Fractionation System

**Principles of Reformer**
- Reforming Catalysts
- Catalytic Reforming Reactions
- Reactor Conversion and Reformate Yield
- Catalyst Deactivation
- Catalyst Regeneration

**Key Controlled and Operating Variables**
- Reactor Inlet and Differential Temperatures
- WAIT and WABT
- Reactor Pressure
- Hydrogen to Hydrocarbon Ratio and Recycle Rate
- Feed Rate or Space Velocity
- Feedstock Properties
- Chloride and Water Injection

**Safeguard System**
- Introduction
- Emergency Unit Shutdown (ESD)
- Naphtha Feed Shutdown
- Reactor Furnace Shutdown
- Recycle Gas Compressor Protection
- Product Separator Low Level Protection
- Stabilizer Reboiler Furnace Shutdown

**Troubleshooting**
- Loss of Naphtha Feed
- Loss of Recycle Gas
- Loss of Reactor Furnace
- Loss of Cooling
- Loss of Stabilizer Reboiler
- Sulfur Catalyst Poisoning

**Startup Operation**

**Shutdown Operation**

- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch, French, German, Spanish and Swedish

GSE Systems
www.gses.com/EnVision
Simulation

GSE’s EnVision simulation is a real-time dynamic process simulation program used for Operator Training. It is based upon a rigorous and High-Fidelity mathematical process model to provide a realistic dynamic response of a process unit.

The Simulator allows a Trainee to Practice:
- Startup and Shutdown Operations
- Normal Operations
- Emergency Shutdown Operation
- Control Exercises
- Troubleshoot and practice recovery from Equipment, Instrument, and Control Valve Malfunctions

Major Equipment:
- Feed Surge Drum
- Feed / Effluent Exchanger
- Reactors (Four)
- Reactor Furnaces (Four)
- Reactor Furnace Waste Heat Boiler
- Product Separator
- Recycle Gas Compressor
- Stabilizer

Key Operating Variables:
- Reactor Feed Total: 100.0 M3/H (15.0 MBPD)
- High Quality Naphtha: 50.0 M3/H (7.5 MBPD)
- Low Quality Naphtha: 50.0 M3/H (7.5 MBPD)
- Recycle Gas Flow: 85.0 KNM3/H (3000 MSCFH)
- H2 / HC Mole Ratio: 4.4
- Reformate Product: 81.0 M3/H (12.1 MBPD)
- Overhead LPG: 5.8 M3/H (873 BPD)
- Stabilizer Off Gas: 0.83 KNM/H (29 MSCFH)
- Make Gas Flow: 18.9 KNM3/H (660 MSCFH)
- Reactor Temperatures: 502.0 C (935 F)
- Separator Pressure: 19.0 BAR (275 PSIG)
- Make Gas H2 Purity: 85.7%
- Reformate Octane Number: 98.3

- Simulation comes with a Learning Management System (LMS) called SimAdmin that allows an instructor to register trainees and monitor their performance
- Simulation is available as Standalone (Single or Dual Monitor) and Instructor-Trainee versions

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